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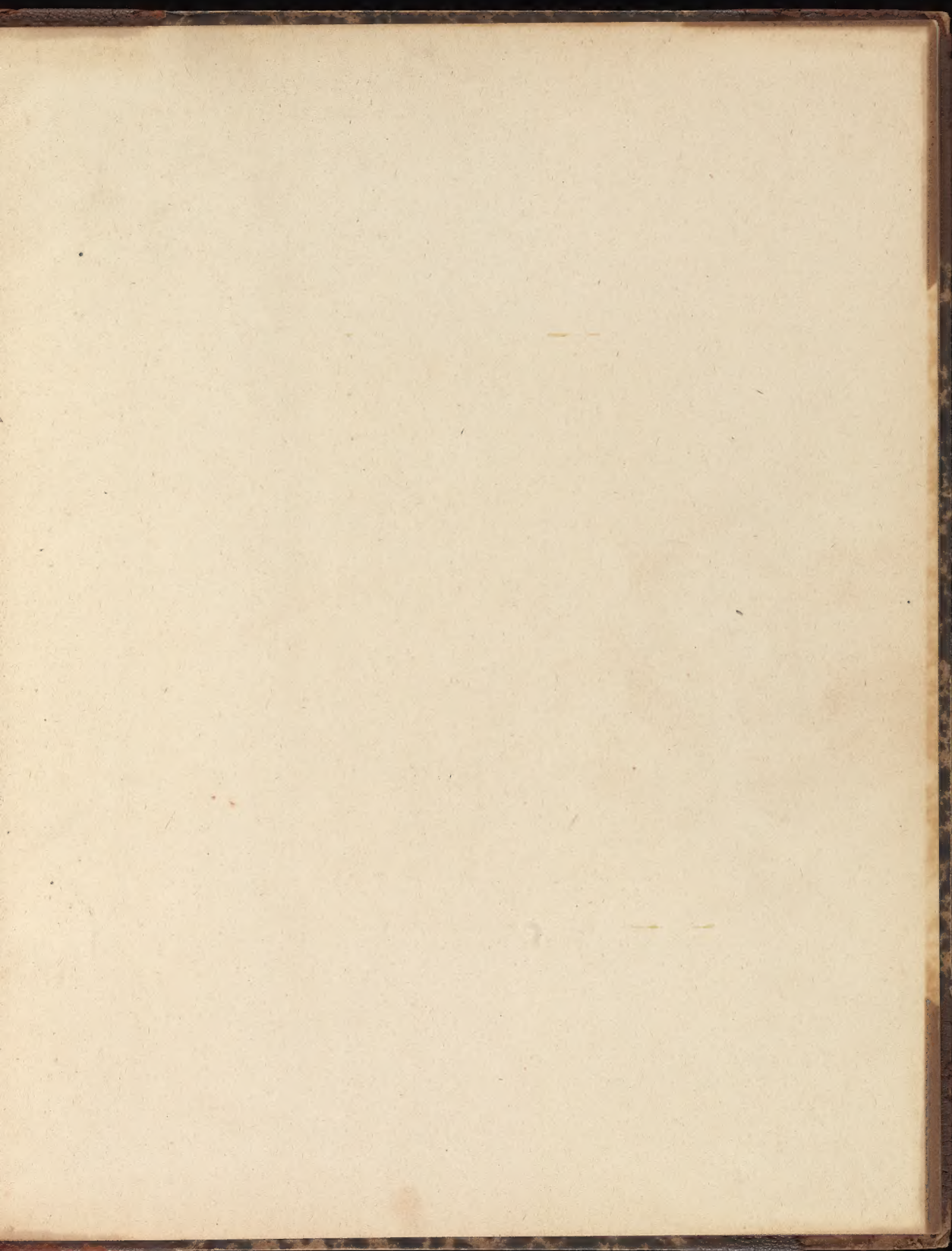
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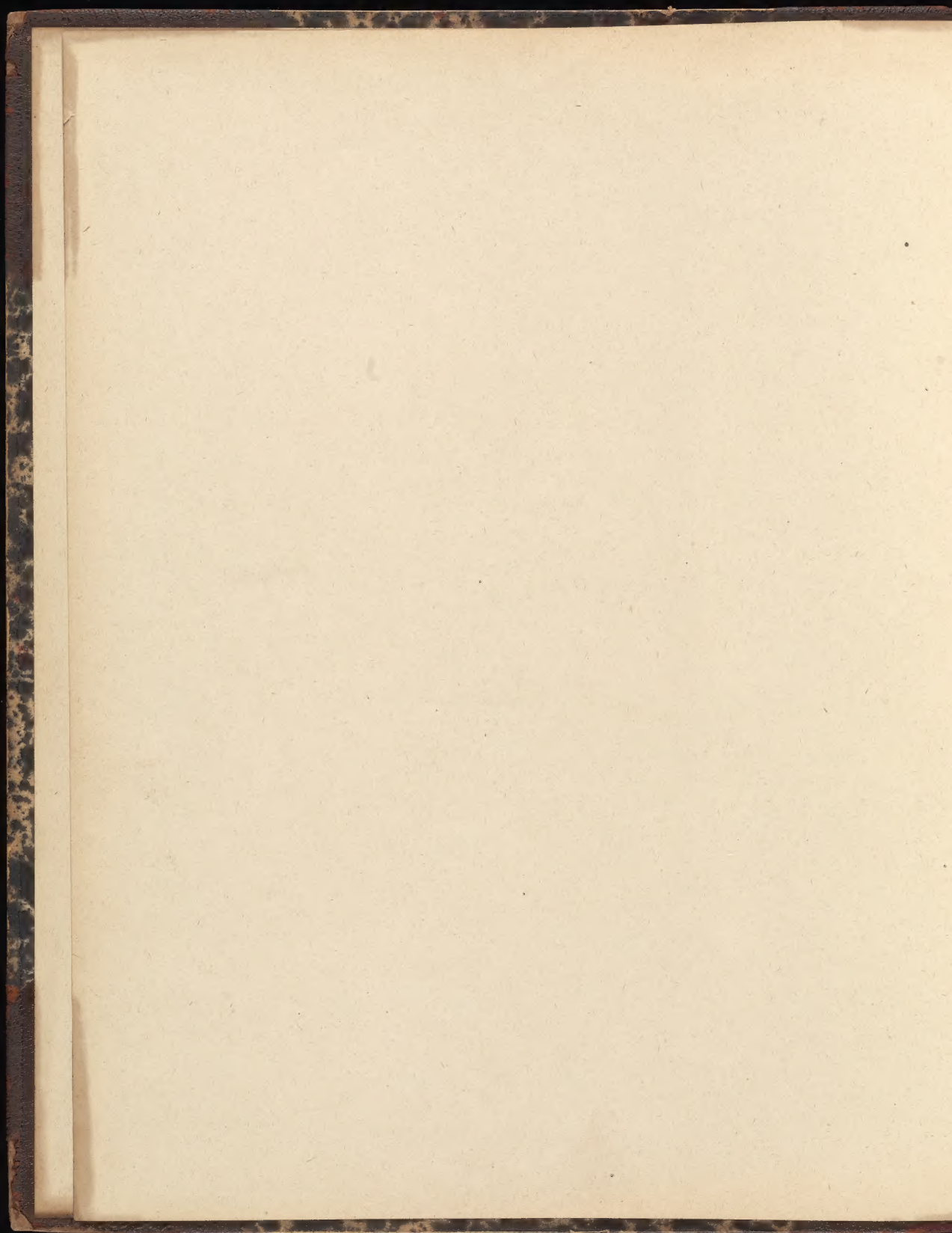
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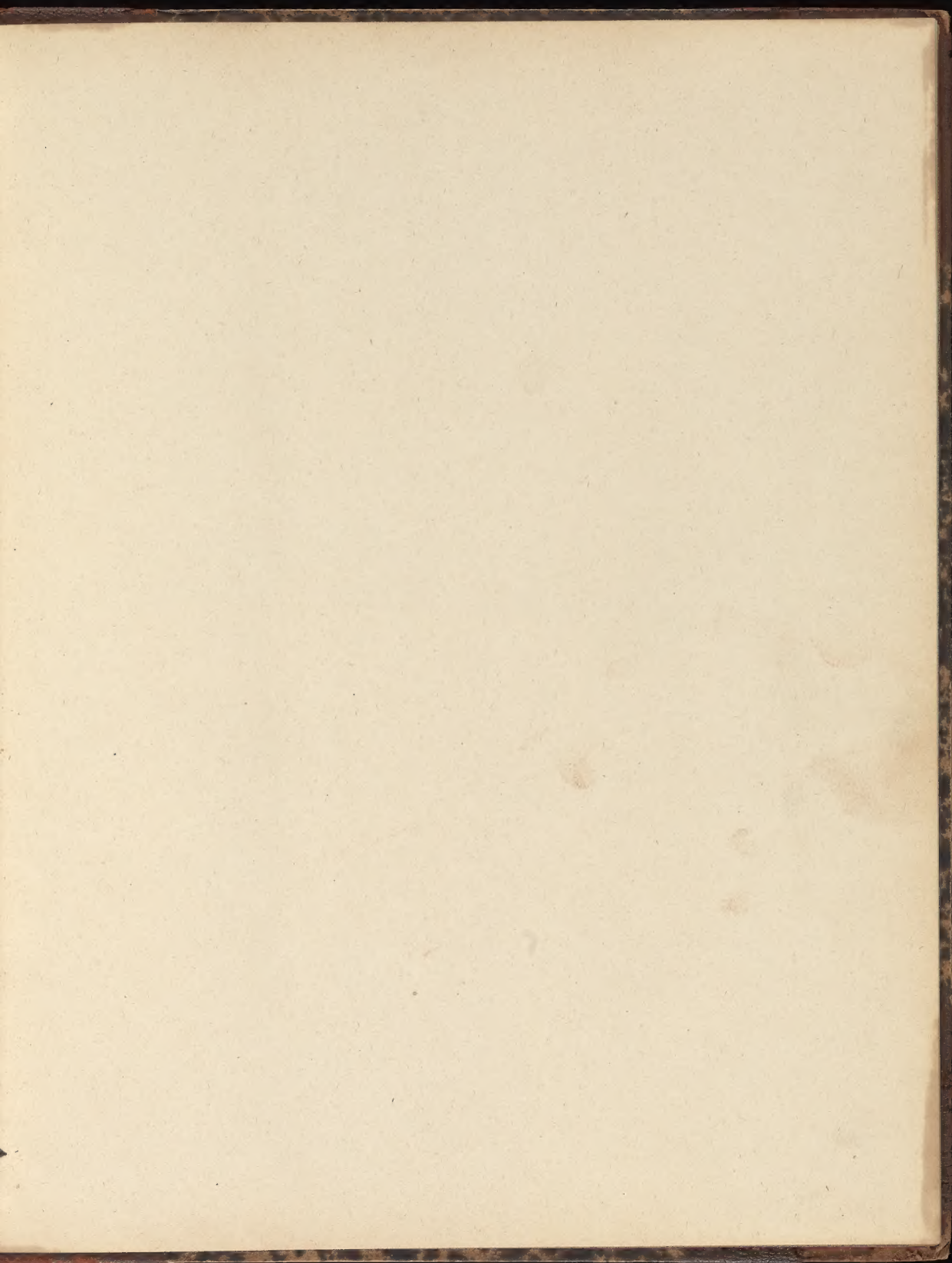
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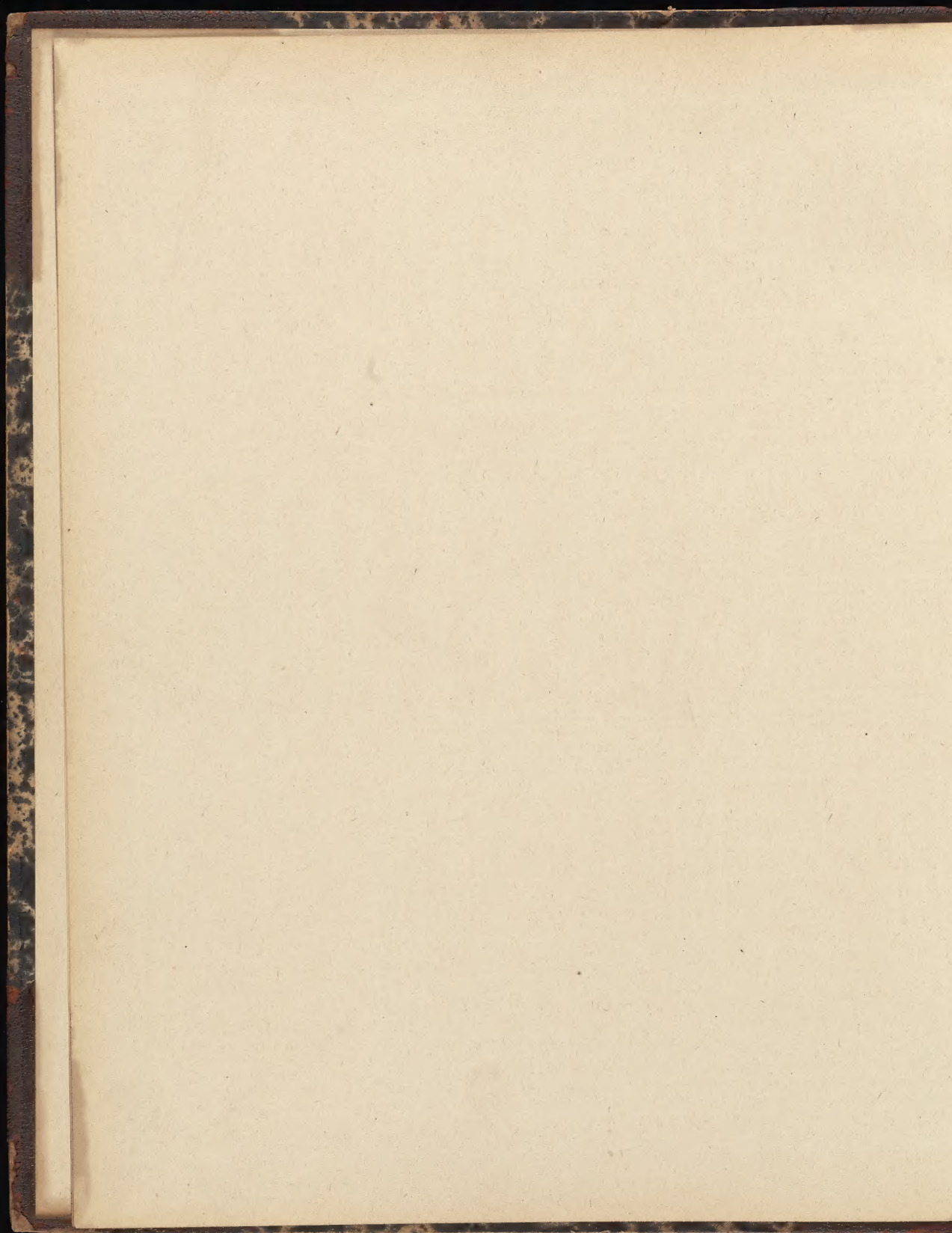
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# THE JOURNAL OF ORIGINAL DESIGNS OF FABRICS

AND

## TEXTILE

## INDUSTRIES.

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July 12th, 1888.

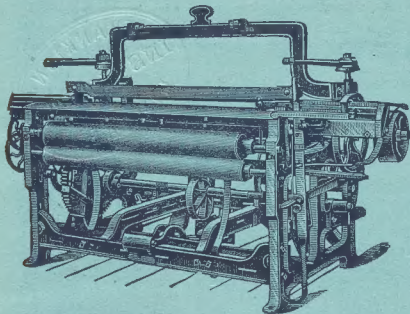
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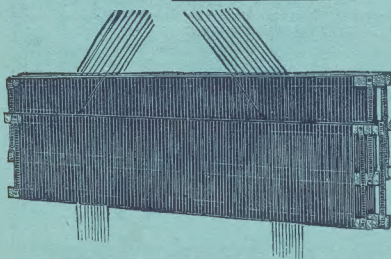
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# The Journal of Fabrics AND Textile Industries.

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## Wool Impurities and their Extraction.

By "TEXTILE."

(Continued from Page 62, Vol. 13.)

In taking into consideration the various agents used to effect a good clean scour, perhaps, the one thing to which the attention is first directed is that the best agents, *i.e.*, those which have the least injurious effect on wool, combined with the best cleansing properties, cannot be used because of the expense appertaining to their employment. Here is scope for improvement and research, and we cannot doubt that, before long, means will be presented to manufacturers to use these agents by those who have been, and are, directing their attention to this subject. The oldest scouring agent is stale wine, which is effective because of the ammonium carbonate it contains, but it has been superseded by many and varied substances as scouring agents, which in some factories still retain the name "wine substitute." Ammonium carbonate, as the nearest approach to the above, should be used if possible, but it is too expensive. Soap is, perhaps, the most useful scourer, taking into account the quality of effect and price. There are two kinds, soda soap, which is hard, and potash soap, which is a soft soap. The latter, as will readily be imagined from potash being a natural constituent of wool yolk, is the best to use, but, at the same time, soda soap is by no means to be despised. Soap is very

easily adulterated, and detection is difficult. Much resin, or too much alkali, will discolour and give a singed appearance to wool, while resin, common salt, earthy matter, and water, may be used as weight-giving substances, but since the analysis of soap was treated of in this journal some time ago, there is no need to go into the subject here. Though soap is suitable for the better classes of wools, for the coarser kinds something stronger must be used along with it. Sodium carbonate is the agent often employed in this case, although it is too strong to use alone except on very rare occasions, yet it is very acceptable to the wool scourer because it is cheap, and, if used with judgment in combinations, is not very detrimental to the wool. Silicate of soda, if used with special care, is said to give good results. No list of scouring agents would be complete without "volatile agents," the use of which has been commented upon above. Carbon disulphide, ether and ammonia, are the most important of these. Their action is to dissolve out the fatty matters, and a wash in water is then necessary to completely cleanse the fibre. Having mentioned the most important scouring agents, we will turn our attention to the consideration of the manner in which the wool is treated with them to give the best results. The old method of scouring, which is still used in small factories, is to have two tanks, one containing the scouring liquor, and the other fitted with the necessary appliances for filling it with water, and emptying it again; it is also supplied with a false perforated bottom. The first tank is then filled with the scouring liquor, the strength and heat of which must depend upon the nature of the wool it is intended to scour, but it should never be so hot that the hand cannot be borne in it. Into this solution the wool is thrown, and, after being worked in it for some little time, is taken out by an iron four-pronged fork, (which agriculturists term a "gripe") and placed on a cray stretched across the scouring tank, so that all the superfluous scouring liquor drains back to the tank. When the wool is considered dry enough, it is thrown into the other tank and well rinsed with water, after which it is taken out and placed where the water can drain away. In large factories this method is too tedious to be adopted, but, though machines are used which give a much better yield, still the principle is the same. The manner of agitating the bath has given rise to much thought. At first, suddenness of movement was employed, but, after mature consideration, this has been entirely changed, for, on this principle, the wool becomes matted together, and thus resists the endeavour of the scour to reach its innermost parts. The principle upon which scouring machines are now largely constructed is that wool has a natural tendency to open out when immersed in water, thus allowing the scour to penetrate and effectually cleanse it. Among the best machines of this class may be mentioned Petrie's and McNaught's. While dwelling on scouring machines, it will, perhaps, be well to describe a process invented by Dr. Braun, a German. The apparatus consists of five vessels connected together as required by pipes fitted with taps; one contains the wool to be scoured, three are set apart for water, alcohol, and ether, respectively, while the fifth collects the ether, alcohol and fat, the two first being, by the arrangement used, almost entirely recovered, thus effecting a great saving in expense. The routine to which the wool is subjected is—first, water is admitted, which expels the air from the wool and also washes it; second, alcohol is admitted; and third, ether, which expels the alcohol, and the excess, dissolves the grease in the wool, and carries it into the collecting vessel. The entrance of ether is then stopped, and alcohol again admitted; after this water is admitted until all the ether and alcohol are removed from the wool chamber, when the process is complete. This method is found to yield much better results than the old way, and is also an example of what was mentioned before, *viz.*—that expense will eventually have to give way to scientific research. This mode of scouring seems to be coming more into use, and other machines, on similar principles, have been invented. In connection with the above described machine, considerable facility is given to the agents to act from the manner in which they are admitted into the wool chamber. Much has been written about wool steeping previous to scouring, a process largely carried out on the Continent; it claims the advantages of a better colour, of saving scour, and of less injury to the fibre.

With regard to colour, this process, perhaps, is advantageous, but, as remarked before, wools which come over here often have a very large percentage of yolk extracted, and this class of work should most certainly be preferred for whites, rather than wools which come over in the greasy state, and which will, no doubt, be thus affected already in colour. Saving soap by steeping, and thus ridding the wool of what may fairly be termed soap, scarcely denotes good sense; perhaps, with exceedingly dirty wool, it may be advantageous to steep first, as the dirt would probably make the bath gritty, and thus injure the fibres physically, but, in most cases, it will be found that wools which have had the outside yolk (or wool perspiration as it is more correctly called) removed, require not less but more scour to completely cleanse them, at the same time, where there are appliances for the recovery of the yolk ash, then, steeping may be carried on to advantage, this, no doubt, being the case on the Continent. The most valuable substances contained in wool yolk are recovered in various forms, and for various purposes; thus, potash salts are obtained from the wash-water products. Again, the wash-water products are utilised for illuminating purposes, while other portions of the yolk are rendered serviceable in soap manufacture. All these methods result in considerable saving, and it is clear that the colonial sheep farmer, who undertakes to wash his wool before exportation, would do well to consider the advisability of utilising the wash-water products.

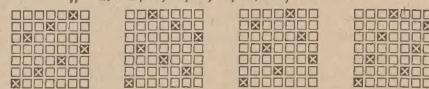
(To be continued).

### Satin Weaves and some of the Uses to which they are applied

There is no order of arrangement so extensively used in the textile trades as satins, and, considering the simple manner in which they are arranged, it is remarkable how few persons, comparatively speaking, there are who really understand the uses to which they are applied, and what power they supply to designers in all the various trades. We intend to give in the following brief notes a few of the uses to which they are put, leaving the designer to his own ingenuity in adapting any particular satin to his immediate use. In the first place, with regard to the arrangement of a satin, and its difference from a simple twill—in a simple twill the weft threads intersect the warp threads in consecutive order, while in a satin no two succeeding warp threads should be intersected by two succeeding weft threads. To attain this, we allow the weft threads to intersect the warp at intervals of two or more, the interval varying according to the number of ends upon which the satin is arranged, and whether we desire the direction of the satin to be with the warp or with the weft. The interval, or base upon which the satin is arranged, is determined by taking any number that is not a measure of the total ends employed, or which, when divided into the total ends, leaves a remainder that is not a measure of the base or number used, as, for instance, if we wish to arrange a satin upon 8 ends, we should take 3 as a base, because 8 is not a measure of 3, or, in other words, if 3 be divided into 8 it gives us a remainder of 2, which is not a measure of 3, the base used; we could not use 5 as a base because it would leave us a remainder of 2, which is a measure of 3. Therefore, the arrangement would be as follows:—Let the 8 threads be represented by the Nos. 1 to 8 consecutively as follows:—1, 2, 3, 4, 5, 6, 7, 8 warp; 1, 4, 7, 2, 5, 8, 3, 6 weft. Then using 3 as a base, we should begin by allowing the first weft thread to intersect the first warp, then counting 3 from that point, we should have the second weft thread intersecting the fourth warp, and again counting 3, we should have the 3rd weft thread intersecting the 7th warp, and, by counting 3 from each point in succession, we should have the weft intersecting the warp in the order 1, 4, 7, 2, 5, 8, 3, 6, which would be a perfect satin, inasmuch as we have all the binding places, or points of intersection equidistant. We might also use 5 as a base upon 8 ends, but we should find that it gave the same result as a base of 3 only in the opposite direction. In fact, whenever two bases are used, which, when added together, are equal to the total ends employed, the arrangements are the same only in opposite directions. This fact is well worthy of being borne in mind, as, in many instances, especially in the binding of double cloths, one satin may be perfectly useless, while its repetition, or

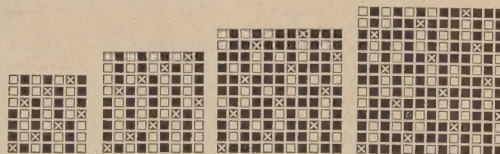
counterpart, would meet the places of binding in their order. In the same manner, we might arrange satins upon 7 ends, using a base of 2, 3, 4, and 5, but, as in the example given of 8 ends, base of 2 and 5 and of 3 and 4 would be repetitions of each other in opposite directions, and we should also find that the base of 2 and 5 would give us a twill running in a horizontal direction, or with the weft; and the bases 3 and 4 in a vertical direction, or with the warp, or in other words, the base nearest the centre gives the vertical, while the base nearest the total gives us the horizontal arrangements, as shown in the following examples:—

	1, 2, 3, 4, 5, 6, 7	
Base 2.	1, 5, 2, 6, 7, 3, 4	Horizontal.
" 5.	1, 4, 7, 3, 6, 2, 5	
" 3.	1, 6, 4, 2, 7, 5, 3	Vertical.
" 4.	1, 3, 5, 7, 2, 4, 6	

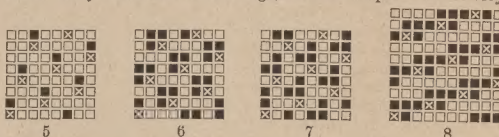


Base 2. 5. 3. 4.

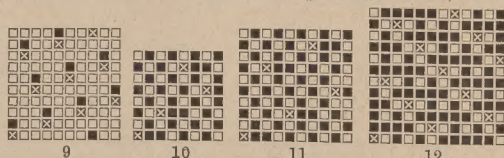
Having shown very fully the principle upon which satins are arranged, we shall give a few examples of the uses to which they are applied. Besides the satins proper where the weft intersects only with one thread of warp, as in such cloths as fine ribbons, Italians, lastings, and in many woollen cloths, where looseness of weaving is desired, so as to get in a great quantity of material, or to give every facility for milling, the satin base is very valuable as a means of re-arrangement of simple twills, for the purpose of making corkscrews, or other fancy patterns, where the direction of the twill is either at a very low, or a very high, angle, or in patterns where the weft or warp float is desired to be distributed as evenly as possible, and the ground or space to be filled in with plain. Stripes and checks are also largely produced from these re-arranged twills, either juxtaposed to each other, or in combination. Figs. 1 and 2 are examples



of corkscrews, arranged on a base of 2 upon 7 and 9 ends respectively, while Figs. 3 and 4 are similar patterns upon 11 and 13 ends, arranged on a base of 4. These are patterns very largely used in the trade, in solid colours, as well as in fancy twists for trouserings, and in stripes. Some very



novel effects are also produced from them by reversing their order after the manner of herring-bone stripes. Figs. 5, 6, 7, 8, 9 and 10, are also very largely used as fancy patterns, both in "all-wools" and in "union cloths." They are also much used in the woollen and coating trades, as solids, twists,



fancy stripes and checks for suitings and trouserings. Figs. 11, 12, 13 and 14, are very applicable, and are largely used in

dress goods, both as crapes and fancy seed grounds. In the making of double cloths, either where they are simply backed with weft or warp, where the object is only to give weight, or in double



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cloths purely, where the pattern on the face is the same as the pattern on the back, or where the two patterns are different, satin orders are always, where possible, used to bind the cloths together. Fig. 15 is a 5 end twill twice repeated upon 10 ends, the object being to bind the pattern with a 10 end satin pick and pick, but, in this case, we shall see that the face pattern moves in ones, or in 5 plus 1 or 6, and as 6 is not a satin base upon 10, it is impossible to bind it in satin order, therefore, we take the next best course, viz.—that of binding each twill and each thread equally, and, as we cannot have the binding up each twill covered on both sides, we bind one of them in such a manner that the picks that follow cover it, as we find that in all double cloths, picks that follow a binding place cover better than picks that go before. Fig. 16 is the same pattern as Fig. 15, with 2 picks of face to 1 of back; in this case, the face pattern is moving in twos in rotation to the back, or in 2 plus 5 or 7, and as 7 is a satin base upon 10, we find that having one binding in one twill, and the next binding in the other twill, the binding places will be 7 ends from each other from left to right, or 3 from right to left, which is perfect satin order. Figs. 17 and 18 are 6 end twills twice repeated upon 12 ends, and, again, in this case, as upon 10 ends, we find that pick and pick is perfect, while 2 picks and 1 are imperfect, inasmuch as in pick and pick the face is moving in ones or sevens, and as 7 is a satin base upon 12, it is perfect, but, in the pattern 2 picks and 1, the face is moving in twos or eights, and as neither is a base, the pattern is irregularly bound in a similar manner to Fig. 15. Fig. 19 is Fig. 8, with a backing weft, the pattern being arranged pick and pick; in this case, the pattern is certain to bind in satin order, because the face pattern is arranged in satin order upon a base of 3, and the binding is in the same order, but if it was arranged 2 picks face to 1 back, the satin order would become 1 of 6, and as 6 is not a base, it would again be impossible to bind it perfectly. Figs. 20 and 21 are Fig. 3 arranged pick and pick, and 2 picks and 1, but, in this case, the face pattern being upon 11 ends, which is a prime number, any number may be used as a base, therefore, in the case of Fig. 21, the face pattern is arranged on a base of 4, and being arranged 2 picks and 1, the base becomes 1 of 8, which is again a satin base of 11. Figs. 22 and 23 are again similar to Figs. 20 and 21, Fig. 22 binding in the same order as the face pattern, and Fig. 23 binding on a base of 8, or double the original base, but as 13 is again a prime number, any base might be taken. In these examples, the binding is arranged to take place upon 3 ends, as a float of 12 would be too great except in very fine sets. In the same manner, if we arrange the above patterns to be backed with warp instead of weft, the same rules would apply, in fact, whatever applies to weft, applies to warp. In Figs 24 and 25, which are double cloths purely, the face pattern being a two and two twill, and the back plain, satin order is the best way of binding them together. Fig. 24 is bound in such a manner that each twill and each end is equally bound, but we find that alternate ends are bound on each pick, which would make the binding too fast, besides having a tendency to show stripes both in the way of the warp and of the weft. Fig. 25 is, therefore, arranged so that the two cloths are bound together in 8 end satin order, which allows each end and each twill to be equally bound, and gives equal and perfect distribution of binding. In the same way, if we are making double cloths, where the patterns are the same on both sides, but where the weft is not desired to take

any part in the binding of the two cloths together, a thin weft thread is sometimes used, which simply passes between the two cloths, binding each in satin order, and in such a way that it is impossible to show through either to the face or to the back.

(To be continued.)

### Flocks and Flocking.

Flocks used in the process of fulling woollen cloths tend to make them thicker and closer, increasing their weight proportionately, and, contrary to a prevailing idea, they are, when moderately used and properly applied, an improvement to them. There is a possibility of a proper use, and also a shameless abuse of the same agent, and the truth of this statement has been fully verified in the use of flocks in the finishing room. Their use, chiefly as a matter of economy, has led manufacturers to overdo it in their endeavours to economise, until the buyers have become justly suspicious. To flock successfully, three things must be borne in mind, viz.:—good quality, proper quantity, and an intelligent application. Now, the quality has more to do with the success of their use than anything else, and it is a fact to be borne in mind that the better the quality the greater the quantity that may be used, because they will felt to the goods more readily and cling closer. The great trouble has been that manufacturers have misunderstood this matter, and in their eagerness to economise have used a cheap quality, with the result that much has been lost when the goods were scoured, and what the fabric contained sifted out on the counter and under the linings of the garments when made up. Had the same quantity of good flocks been used, they would have felted to the cloth better, and remained there as a part of it until it was worn out. Now let us look at the true philosophy of flocking. It is well known to every manufacturer (or should be) that wool is the only felting material known. If we are asked to except some kinds of hair, we may state that there is no place where a dividing line can be drawn between hair and wool, and hair felts only in proportion as it partakes of the nature of wool, and, on the other hand, wool loses its felting quality in proportion as it resembles hair. Now, any substance destitute of the felting principle that is mixed with the flocks renders them less valuable. Many of the flocks that have sold for a low price have been made from questionable stock, possibly from rags which contained more or less of cotton, and only the wool flocks would felt to the goods. It is just as important to have the flocks of good felting quality as to have good stock in the yarn, so far as fulling is concerned. The grinding of the flocks in a way that pulverises them into a fine dust destroys their value, but cutting them properly, though very fine, does not injure them. The great trouble has been in using inferior flocks devoid of the felting principle which causes them to cling to the goods. All-wool flocks and all wool goods set together in fulling, while, with flocks composed of any other substance, the goods alone full, and such an amount of flocks as could be stuffed into or pasted upon the cloth would remain for a time, but they shake out or wear off very easily, besides which, not more than one-half of those applied would cling to the goods through the fulling and scouring processes. Goods that have a coarse open back will hold inferior flocks the best, but they give a hardness to the fabric which good all-wool flocks do not. We have seen flocks that cost 11d. per lb. used on cloth when they would all be well felted to the goods, and upon trial, the same goods would not retain over one-half of the flocks applied that cost 8d. So it will be seen that to economise one would need to use the best. Next in importance to quality is quantity. Now, "there's reason in all things," and there must be a line drawn somewhere. It is our opinion that upon good stock and with good flocks, quite a liberal quantity can be applied. But it should be made a point to use only what will remain as a part of the goods as long as they are worn. Any one desiring to use a small quantity will do well to apply just what the fabrics shrink in finishing, thus finishing the goods just the weight they come from the loom. There is a section in a certain part of New England, where, about ten years ago, flocking was at its height. It was a correspondent's good or bad fortune to be called to a mill there to do

\* For Fig. 15 to Fig. 25 see design plate in centre of Journal.

the finishing. The mill was running on heavy weights, as they called them—that is to say, the weave room was running on light weights, and the finishing room was trying to run on heavy weights. The mill ran the year round on 18 oz. goods (from the loom), and when the season for heavy weights came round, they simply notified the finisher to finish them 26 or 28 ozs. as the case might be. "When I entered the mill," he says, "I found the former finisher could only get them up to 22 and 23 ozs., and they desired to have them weigh 28 ozs. I did not like the arrangement, but I concluded to give them what they wanted if possible. I flocked them up to 29 ozs., and they reduced them to 17 ozs. in the weave room, and it was stuffing them to the extreme. The flocks were poor, and it was quite impossible to bring out the fancy colours very brilliant, as such a quantity of cheap flocks was sure to render them more or less dull. Another injury caused by such flocking was that it checked the fulling, so that the goods had to run in the mills longer than was good for the colours. As light weight goods they were a success, but as heavy weight the flocking was overdone." The manner in which the flocks are applied has very much to do with the success of their use. There is a diversity of opinion upon this point. The writer favours applying while the fabrics are fulling. If many are to be used, it may be well to put a few on before soaping the goods for fulling, allowing them to run sufficiently to become evenly spread upon the cloth. It requires care and attention to flock with the goods wet, as only a little should be sprinkled on at a time, and only as often as they become attached to the cloth. By this method they do not become embedded in the bottom of the mill, nor rolled up, as they do when a larger quantity is put in before soaping, as is customary with some. Manufacturers using flocks should have a good flock-cutter, kept in good running order, and thus they will be able to make use of all their gig and shear flocks, which if properly prepared, are as good, and usually better, than they can buy. There will be some waste from the fulling mills, which may be dyed and mixed with the other flocks in cutting, and thus be of some use.

### The Brussels International Exhibition.

No doubt, a large number of our readers will be tempted, during this summer, to make a trip to Brussels, considering the great attraction which is offered in the International Exhibition. Therefore, without further introduction, we will proceed to give a few particulars of interest with special reference to the British section. The exhibition is situated within easy distance of the best parts of the city, and occupies, with the grounds, over one hundred acres. The utmost endeavours have been put forth for the comfort, convenience, and amusement of visitors. The building devoted to the British Empire will be found to occupy a favourable position, and will be recognised from its close resemblance to the Jubilee Exhibition buildings in Manchester, of which it formed a part. The transporting from one country to another of a building of such proportions shows considerable enterprise, and merits the success which has, so far, attended it. Speaking of the exhibits, although they are not very numerous, yet in character and arrangement, an excellence creditable to the British Empire is displayed. We give a few particulars concerning those of interest to the textile trades.

#### TEXTILE FABRICS, &c.

Under the head of Textile Fabrics, &c., one of the most noteworthy exhibits is that of Messrs. Rylands and Sons, Limited, whose extensive warehouses in Manchester, and mills in Manchester, Bolton, Chorley, Crawshawbooth, Heapey, Wigan, and other places, find employment for over eleven thousand persons. These works contain 200,000 spindles, and about 5,000 looms. The goods exhibited consist of grey, scoured, bleached, and dyed calicoes, fancy cotton goods and quilts, ticks, regattas, Oxford and Harvard shirtings, dyed satens, Turkey red quilts, waddings, cotton yarns, prints, handkerchiefs, mufflers, covers, counterpanes and quilts, ladies', gentlemen's, and children's underclothing, ready-made clothing, mantles, sewing cottons, tapes, smallwares, umbrellas and floor oil cloths. The woollen and worsted industry is represented by some well-known firms. Messrs. Armitage Brothers, Milnbridge, Huddersfield, show a good selection of woollen and worsted cloths, for the manufacture of which they are well known. Messrs. William Thompson and Sons, Limited, Woodhouse Mills, Huddersfield, display woollen and worsted cloths, particularly for men's wear. This firm is carried on upon the industrial partnership system, whereby each operative shares in the profits. This system should produce the best results from the workers, and ought to be an effectual check against strikes. Messrs. Apperley, Curtis and Co., Dudbridge Mills, Stroud, have a good selection of woollen and worsted superfine coatings on view, which demonstrate the high quality of goods manufactured in the west of England. Messrs. D. C.

Apperley and Co., 6, Cripplegate Buildings, Wood Street, London, show specialities in woollen fabrics for coatings, suitings and trousseings, which have been manufactured from their own designs. Messrs. Humphries and Thomas, Narberth, North Wales, show Welsh flannels and shirtings. In yarns, threads, &c., there are a few well-known makers exhibiting. Messrs. George Lee and Sons, Limited, Wakefield, have on view knitting and hosiery yarns, specimens of wool in the raw state and in process of manufacture. Messrs. William Holland and Sons, Victoria Mills, Manchester, show Sea Island cotton in various processes of manufacture, cotton yarns of best qualities, combed, water twist, single cops for sewing thread and manufacturing purposes, two-fold cops, gased yarns, sewing cotton, and heald yarn. The Island Spinning Company, Limited, Island Mills, Lisburn, Ireland, exhibit flax in all its stages, and also flax yarns and linen threads. Messrs. Dunbar, McMaster and Co., Limited, Gilford, Ireland, make a good display of linen yarns, grey and bleached, for the manufacture of plain linens, drills, damasks, lawns, and cambrics, linen thread for hand and machine sewing and knitting, of all colours and finenesses. Messrs. James Chadwick and Brothers, Eagley Mills, Bolton, show sewing cottons and general smallwares, sewing, crochet, and knitting cottons, wool and mending cards, tapes, webs, cords, carpet and worsted binding, &c. The White Abbey Flax Spinning Company, Limited, Belfast, show yarns also. Whilst on the subject of fabrics, &c., we may mention an exhibit consisting of a scientific preparation for renewing the colour of silk and other fabrics, which is shown by Mr. W. V. Houghton, 4, South Crescent, Tottenham Court Road, London.

#### MACHINERY, &c.

Makers of English machinery for the textile trade have taken but slight advantage of the opportunities of showing their productions at the Exhibition, but this may be, in a great measure, due to the excellent and expensive displays made at the Manchester Exhibition last year, and to the fact that others have preferred to show at Barcelona and Melbourne. Still, what little there is being exhibited is of a superior order, and is certain to bring substantial benefit to the exhibitors. Mr. George Hodgson, of Bradford, Yorkshire, at Stand 91, occupies a whole court for the exhibition of different systems of looms adapted to the weaving of various kinds of cloth, and for which he is justly celebrated throughout the textile world, but we shall give a full description of these looms in a future issue of the Journal. At Stand 16, Messrs. Wilson Bros., Cornholme Mills, Todmorden, have an excellent display of bobbins, tubes, spools, and such like appliances for preparing, spinning, and manufacturing different classes of textile fabrics. This firm have, for some years, been in the van of producers of this kind of apparatus, having a large business with every textile district throughout the world. A short time ago, we had an opportunity of going through their works at Todmorden, where more than 300 men are constantly employed in making bobbins, &c., of the most useful types, having advantages of the utmost importance in the present days of competition. They have a number of patented articles amongst their exhibit, which possess decided improvements over bobbins in general use. Messrs. Wilson and Co., Beevor Works, Barnsley, also show, at Stand 16, a fine selection of bobbins, tubes, spools, skewers, pirns, and such like articles, for use in the cotton, wool, worsted, flax, silk, lace, and other textile trades. This firm are also well to the front with the excellence of their productions, having numerous specialities and patented appliances for strengthening and protecting the above. The Titanerete Company, 8, Deansgate, Manchester, exhibit their patent fire-proof material, from which the company derives its name. This is shown applied to various purposes, as, for instance, the lining of tanks, columns, doors, &c. It will be noticed that this substance, so effectually resisting the effects of heat, is particularly adapted for use in the construction of all kinds of textile works, as, not only should floors, walls and ceilings be fire-proof, but the material should be used for all partitions and doors. Mr. Henry Ashworth, of the firm of Mr. R. Threlfall, Bolton, exhibits his patent compound spinning mule, provided with a double row of spindles numbering three hundred and fifty in all. By this invention, only one set of rollers is required, and the spindles are placed zig-zag. A mule made upon this principle will produce twice the amount of work which can be got from an ordinary mule within the same space and by the same amount of power. Recently, we gave a full description of this mule, with illustrations, and, therefore, our readers may have further particulars by a reference to that article. We may add that one whole court is occupied with the spinning mule, and that the Stand is No. 92. Messrs. Rushton, Proctor and Co., Lincoln, have on exhibition a twenty horse power nominal compound engine, which is mounted on strong metal base-plate, suitable for a working pressure of 120 lbs. per square inch, and capable of developing 60 horse power. The steam is supplied from a low multi-tubular boiler, to work at 120 lbs., which is located at the rear of the buildings. Messrs. Alexander Shanks and Son, Dens Ironworks, Arbroath, Scotland, and 110, Cannon Street, London, show a direct-acting steam pump, which is of a class suitable for pumping purposes generally. This firm are well known, therefore, nothing further need be said of the exhibit. Mr. Edward Moser, 1, Wellington Street, Leeds, shows, at Stand No. 96, a patent wire card raising machine, with differential motion and needle pointed cards. This machine raises a full and even nap upon any class of cotton, woollen, worsted or mixed fabrics, with one and the same

card. Manufacturers of textile fabrics will find a visit to this exhibit not only interesting but valuable, as it embodies great improvements in this class of machine. The Leeds Forge Company, Limited, Leeds, make a splendid display of the patents for which the company and the inventor, Mr. Fox, have gained a reputation. These include Fox's patent rolled steel boiler furnace flues, hydraulic flanged and pressed parts of mild steel for boilers, Leeds Forge Siemens' mild steel boiler plates, each of which should interest those of our readers who visit the exhibition. They also exhibit Fox's patent corrugated goods, and numerous other heavy articles of a general character. Maignen's "Filtre Rapide" and "Anti-Calcaire" Company, Limited, 82, St. Mary-at-Hill, Eastcheap, London, E.C., show specimens, in various sizes, of Maignen's patent "Filtres Rapides," for purifying water, and also Maignen's patent automatic process for softening water. Messrs. David Moseley and Sons, Manchester, show their "Simplex" cotton beltings. The varied manufactures of this firm are so well known that we need say nothing here with reference to them. Messrs. James Stott and Co., Vernon Works, Oldham, and 174, Fleet Street, London, show the patent "Stott" gas governor, and the Stott "Detective" gas governor for economising the consumption of gas, and preventing gas explosions. Chatwood's Patent Safe and Lock Company, Bolton and Manchester, show a very fine collection of safes and locks, and Messrs. Chubb and Sons, Lock and Safe Company, Limited, 128, Queen Victoria Street, London, make an important display of safes, locks, strong rooms, and panic door locks. The whole of the locks throughout the British section are supplied in several series by Messrs. Chubb and Sons. Each lock has a separate key, each series has a sub-master key, and there is one master key which opens all the locks in the building. The Doty Lighting and Heating Corporation, Limited, 11, Queen Victoria Street, London, show the "Doty" lamp of 50, 500, 1000, or greater, candle power. The Wenham Company, Limited, Upper Ogle Street, Fitzroy Square, London, show their patent regenerative gas lamps, suitable for all purposes. The Electrical Power Storage Company, Limited, 4, Great Winchester Street, London, have an exhibit of secondary batteries, motors, and measuring instruments, &c. The Babcock and Wilcox Company, New York, and 107, Hope Street, Glasgow, exhibit a 68 h.p. Babcock and Wilcox Company patent water tube steam boiler. Such are a selection of those exhibits which appear to command most attention from textile manufacturers, and it will be readily seen, as stated at the commencement of this review, that machinery of a textile description occupies no very large amount of space in the exhibition.

### On the Indigo Bath for Dyeing Wools.

BY DR. BRUNO LINDENBERG.

The present mode of working the indigo bath demands much previous practice, without which, frequently, the entire loss of the bath results. Care must, in the first instance, be taken to provide a continuous source of hydrogen, in conjunction with as much free alkali as may be necessary, to dissolve the indigo-white formed. Up to the present time, we have been using for dyeing wool the so-called woad, soda, potash, urine, and sugar baths. These kinds of baths are too well known to require a fresh description. Again, we have the so-called hydro-sulphite bath recommended by Schützenberger, as also the zinc bath introduced by Leuchs. The former would hardly appear to be much used, while the latter is mainly brought into requisition as a cold bath for cottons and linens. I will now proceed to describe a practically approved fermentation bath which I have introduced into the largest South American cloth and buckskin manufactory, viz., that of August Kaiser, at Bellavista-Tomé in Chili (of which I am manager and director), which is quite certain in its action even in the hands of ordinary workmen, provided they are only even moderately careful. I term this bath the meal bath. It is prepared in the following manner:—15 kilos. of wheat flour are mixed with cold water and stirred up into the consistency of milk, the formation of lumps being avoided. This is then placed in the vat filled with water, heated up to 81° C., adding 6 kilos. of ground indigo and 80 kilos. of crystallised soda; the mixture is then well stirred and left to ferment, which takes place in from twenty-four to forty-eight hours. Then dyeing and stirring takes place three times daily, viz., morning, noon, and night. When necessary feeding takes place with—

3 kilos. indigo,
3 " meal,
6 " soda crystals,

at a temperature of 60° C. in the evening, so that on the following morning the dyeing temperature stands at about 62.5° C.

Should it be undesirable to add any fresh indigo, the bath must nevertheless be warmed daily with 1 kilo. of flour and 2 kilos. of soda crystals, always bearing in mind that the temperature must be kept up to 69° C. Sharpening takes place in the usual manner with lime, of which, however, in no case must more than one-third of the total weight of soda be used. Where the indigos used are of very pure quality, this addition of lime can be omitted. I prefer the soda crystals to the calcined soda, for the reason that their composition is almost invariably uniform. The fermentation is, as is well known, in the primary state a lactic acid fermentation, while in the secondary stage the lactic acid becomes transformed into butyric acid, with development of hydrogen. Both processes are carried out simultaneously in the indigo bath. The spent indigo bath can be considered as a very good and cheap source of butyric acid. If starch sugar is at hand, then the same offers an excellent means of assistance in reducing the indigo. The finest pulverisation of this expensive dyestuff is, as is well known, a main condition of the composition of the bath, consequently, when mashing, I add to 6 kilos. of indigo, 1 kilo. of caustic potash or caustic soda, and 2 kilos. of starch sugar. Again, it is of advantage to heat the pulp prior to bringing the same into the bath, by which means a complete dissolving results, even in the case of coarsely ground indigo. Whether the famous zinc-powder bath in vat-dyeing has hitherto been used in the warm process I am not able to state with certainty, but, I nevertheless doubt it for the reason that the indigo white in the zinc bath disappears very rapidly, consequently, the bath has to be very frequently replenished in order to provide an equal and correct supply of hydrogen. As, in the case of this bath, caustic alkalies have to be called into requisition, which, when used in excess, attack the wool, I thought of a method of obviating the rapid oxidation of the bath. This method is the neutral sulphite of soda. I compose the zinc dust bath as follows:—

3 kilos. ground indigo.	2 kilos. caustic soda.
6 " zinc dust.	2 " caustic lime.

These are boiled together in the necessary quantity of water until the indigo is reduced; this I then place in the bath filled with water, which is heated to 62.5° C., and which is displaced with 10 litres of neutral sulphite of soda of 20° B., stirred and allowed to settle. For feeding I use

3 kilos. indigo.	1 kilo. caustic soda.
3 " zinc dust.	1 " caustic lime.
5 litres sulphite of soda.	

In addition to the substances cited above, to each kilo. of indigo, 1 kilo. of crystallised carbonate of soda must be added. This bath acts very well, never spoils, while it can be interrupted at any time. (The improvement mentioned by the author of the zinc bath is a modification of Schützenberger's hydrosulphite bath. So far as we know the latter has been practically used in a large dyeworks in the Vosges).—*Chemiker Zeitung*.

### Testing Indigo Dyes.

A German author deals with the question whether a sample of goods is dyed with indigo alone or with a mixture of indigo and other blue colouring matters. His method may be summarized as follows:—Threads of the material in question should give up no colouring matter to boiling water. Alcohol at 50 and at 95 per cent. (by volume) ought to extract no colour, even if gently warmed (not boiled). Solution of oxalic acid saturated in the cold, solution of borax, solution of alum at 10 per cent., and solution of ammonium molybdate at 33½ per cent., ought not to extract any colouring matter at a boiling heat. The borax extract, if subsequently treated with hydrochloric acid, should not turn red, nor become blue on the further addition of ferric chloride. Solutions of stannous chloride and ferric chloride with the aid of heat ought entirely to destroy the blue colouring matter. Glacial acetic acid on repeated boiling should entirely dissolve the colouring matter. If the acetic extracts are mixed with two volumes of ether, and water is added so as to separate out the ether, the water should appear as a slightly blue solution, the main bulk of the indigo remaining in suspension at the surface of contact of the ethereal and watery stratum. This acid watery stratum should be colourless, and should not assume any colour if a little strong hydrochloric acid is allowed to fall into it through the ether. No sulphuretted hydrogen should be evolved on boiling the yarn or cloth in strong hydrochloric acid. On prolonged boiling, supersaturation with strong potassa in excess, heating and adding a few drops of chloroform, no isonitrile should be formed.



### ORIGINAL DESIGNS.

On our first plate, we give a design of a useful character, suitable for a Lace Curtain.

Our second plate consists of a number of figures illustrating an article which appears in our pages on "Satin Weaves and some of the uses to which they are applied."

On our third, is a design for a Printed Window Blind. This design, besides being adapted for the purpose for which it is intended, is suitable for a variety of purposes, which we must leave our readers to determine.



### MONTHLY TRADE REPORTS.

**Wool.**—At the sales in London, a large quantity of wool has been sold at higher prices, these having been thoroughly established, owing to the keen and spirited biddings of Continental buyers. In the Bradford and other wool manufacturing districts, although the demand has only been for actual consumption, prices have had a hardening tendency in sympathy with the London sales. The yarn branches have been rather quiet, spinners being indisposed to book large orders, unless at an advanced rate, and this has had a tendency to curtail business, still they are fairly busy on old contracts. Manufacturers have found a rather better state of things, the demand for fancy and cashmere dress goods having improved, and the same may be said of worsted coatings. The home and American merchants have been the chief buyers, whilst those for the Continent and the east have recently purchased less than usual.

**Cotton.**—In raw material, sales have ruled an average one, with fluctuations in prices, but with a generally hardening tendency. The latter fact has induced spinners to ask higher rates for yarns, and this has had a rather quietening effect upon demand, still the yarn sales have reached an average. Many inquiries have been made for the east, but the advance asked by spinners has had the effect of stopping business, although, where old rates have been accepted, fairly large orders have been booked. The demand for the Continent has improved. In cloth, manufacturers complain much of the low prices, still a fair business has been done, mostly for eastern countries. The Continental and American demand has fallen off slightly.

**Woolen.**—A steady trade has been done in this industry. Worsteds in fine and fancy yarns have had many inquiries, and fairly good orders have been placed in repeat fabrics, but for winter goods not much has yet been done. In fine fancy tweeds, chevots, &c., fair sales have taken place, the demand being chiefly for those in stripes, with effective designs and colourings. In medium qualities of goods, only a moderate business has been done, although some admirable cloths have been on offer. In low fabrics, a good demand has been experienced, and orders have been freely booked for repeat goods. The ready-made clothing trade has slackened slightly, but still the demand for this branch is large, and seems likely to continue for some little time.

**Lace.**—The lace trade keeps in a depressed condition, the amount of business done during the month having been below the average. The output of curtains has been large, but prices

have ruled unsatisfactory, owing to the excessive competition which exists. Millinery laces have had few inquiries, novelties having been scarce. Nets have sold fairly well, but at low rates, and in this branch there has been a falling off in demand. Generally, the outlook is not cheering.

**Linen.**—An improvement in this branch of trade has been experienced, although much short time is being run in some departments. Damasks, both fancy and plain goods, have been more inquired for, and the same may be said of toilet and domestic cloths. Sheetings and drills have been rather quiet. The flax and jute branches, both in yarns and cloth, have had an improved demand at harder rates, and as a much better feeling prevades both these industries, the outlook is cheering.

### The Honiton Lace Industry.

A report by Mr. Allan Cole, Commissioner from the South Kensington Museum, on the present condition and prospects of the Honiton lace industry, has been published as a parliamentary paper. The report ends with the following suggestions:—"How this may be attempted is perhaps more important than anything else at the present crisis. Without the provision of some means to rear a generation of workers which may succeed the existing one, the industry is apparently doomed to die out. The Education Act has virtually closed the dames' schools where children used to be taught lace-making. The Factory Acts, I believe, also prevent the instruction of young children as formerly. The literary tendency of the elementary school courses has apparently cultivated a distaste in children for the industry, and may not have given them any substitute for the training to a domestic industry, such as the lace schools provided. I would, suggest, therefore, that some provision might be made to sanction instruction in lace-making in a few of the elementary schools in the lace-making districts. Such instruction could, I believe, be adequate to its intended purpose without detriment to the aim of the literary instruction, the amount of which would, no doubt, require to be diminished in such cases. As regards this, the courses of instruction in lace-making for elementary schools, might be so arranged as to encourage peculiar ability in making one or other of the parts of which a piece of lace is usually composed. Broadly speaking, a bit of Devonshire pillow lace is made up (1) of the "clothing" or close linen-like parts, (2) of the fillings or open ornamental insertions in the spaces surrounded by the "clothing," and (3) of the grounding. Children showing an aptitude for one or other of these parts (and in the best kinds of work this is found to be the case with adult workers) might be specially trained to excel in it. Suggestions upon starting classes of this description might be derived from the lace schools in Bohemia and elsewhere. The employment of new patterns, and the making of new departures, would, I believe, materially affect the industry. Fashion and private experiments could, perhaps, be so directed as to exert an influence upon the employers of labour, who are, of course, the persons by whom any permanently effective action in this direction can be taken. Nevertheless, it is possible that something can be done in a way like that which has met with a certain measure of success in Ireland. For this purpose steps might be taken which may be indicated under three sections:—(a) By means to be provided by the Science and Art Department; lectures upon Devonshire lace might be given, and inspections granted to encourage efforts in designs. (b) A private committee might be formed, and raise a fund for prizes to be awarded for improved designs and new experiments in lace-making. (c) A second fund might be raised, or Government grants offered, for the awarding of substantial prizes of £10 or £20 to the best of the proposed lace-making classes in elementary schools."

### Commercial Failures.

According to *Kemp's Mercantile Gazette*, the number of failures in England and Wales gazetted during the five weeks ending Saturday, June 30th, was 475. The number in the corresponding five weeks of last year was 426, showing an increase of 49, being a net increase in 1888, to date, of 40. In addition to these gazetted failures, there were 354 Deeds of Arrangement filed at the Bills of Sale Office during the same five weeks, making a total in 1888, to date, of 1,695. The number of Bills of Sale published in England and Wales for the five weeks ending Saturday, June 30th, was 1,167. The number in the corresponding five weeks of last year was 1,227, showing a decrease of 60, being a net decrease in 1888, to date, of 801. The number published in Ireland for the same five weeks was 68. The number in the corresponding five weeks of last year was 64, showing a decrease of 4, being a net decrease in 1888, to date, of 98.

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THE JOURNAL OF FABRICS AND TEXTILE INDUSTRIES.

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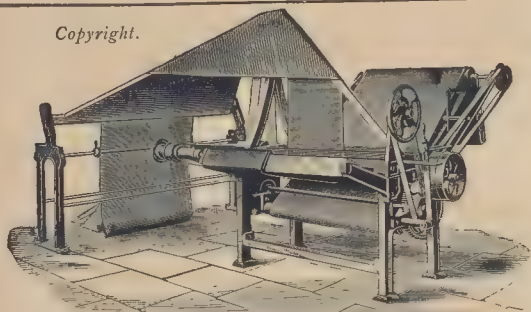
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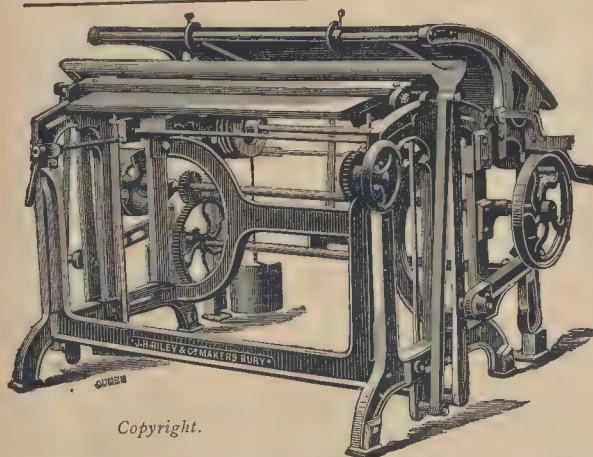
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### ELDER & RILEY'S PATENT RIGGING MACHINE

for Stuffs and Woollen Cloths, as supplied to Her Majesty's Clothing Depot, Pimlico, and to the Indian Government. References to a large number of machines at work.



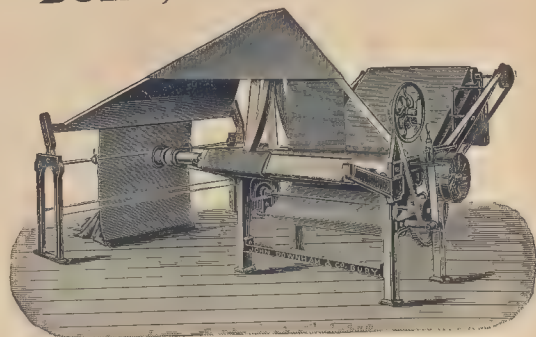
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### RILEY'S PATENT GRIP CUTTLING MACHINE

For Single and Doubled Woollens, the best and strongest Machine made.  
We have some scores of these machines at work.

**J. H. RILEY & CO.,  
BURY, NEAR MANCHESTER.**

## JOHN DOWNHAM & Co. BURY, near Manchester.



**ELDER'S RIGGING MACHINE,**  
WITH DOWNHAM & CO.'S PATENTED IMPROVEMENTS,  
For Doubling all kinds of Woollen and Worsted Goods lengthwise.

**IMPROVED CUTTLING MACHINES**  
For Folding Single and Double Woollens and Worsteds.

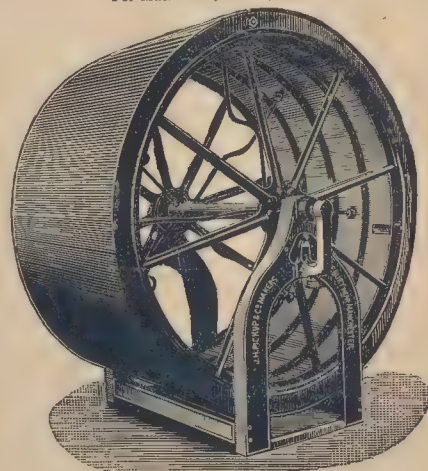
**STEAM DRYING MACHINES,**  
WITH TIN AND COPPER CYLINDERS,

Calenders, Beetles, Dye Becks, Dye Jigs, &c.  
Prices and Drawings on application.

**J. H. PICKUP & CO.,**  
(Successors to JAMES ANKERS)

**TIN-PLATE WORKERS, COPPERSMITHS, &C.,**

**Britannia Works, BURY, near Manchester,**  
Makers of every description of Tin, Iron, Zinc, Brass & Copper Goods,  
For Machinists, Cotton, Woollen and other Mills.



Tin Rollers for  
Ring Frames,  
Mules, Throstles,  
Winding and  
Warping Frames

We have made a speciality in Tin Rollers, knowing the importance of Machinists and Mill Owners having a good and true Roller to run the speeds that are now required. Our Rollers are made from the best sheets, and put together by very efficient workmen.

**LARGE STEAM DRYING CYLINDERS,**  
Any diameter up to 12-feet, and any length, either in Tin or Copper.

**SINGLE CASED OR CAVITY CYLINDERS** made on the most approved principle.  
ESTIMATES ON APPLICATION. REPAIRS PROMPTLY ATTENDED TO.





# THE JOURNAL OF FABRICS AND TEXTILE INDUSTRIES.

27th JULY 1884.



THE JOURNAL OF FABRICS AND TEXTILE INDUSTRIES.



PRINTED BY



## FASHIONABLE \* DESIGNS.

### Suitings or Mantle Cloths.

No. 532.

Warp :—

6 ends	Drab woollen 18's.	} 3 times.
2 "	Brown 40's twisted to White 40's.	
4 "	Drab woollen 18's.	
4 "	Brown 40's twisted to White 40's.	

\* Design.

Woven as warped.

Straight draft.

2,048 ends in warp; 32 ends per inch; 28 picks per inch; 8 healds; 18's slay; 2 ends in a reed; 64 inches wide in loom; 56 inches wide when finished. Weight about 16 ozs.

No. 536.



No. 533.

Warp :—

18 ends	Grey Mixture, 14 skeins.
4 "	White 30's twisted to Tan 30's.
16 "	Grey Mixture, 14 skeins.
2 "	White 10's twisted to 30's Scarlet knob twist.

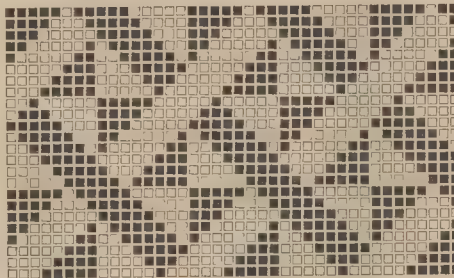
\* Design.

Woven as warped.

Straight draft.

1,664 ends in warp; 26 ends per inch; 24 picks per inch; 8 healds; 18's slay; 2 ends in a reed; 64 inches wide in loom; 56 inches wide when finished. Weight about 16 ozs.

No. 537.



### Worsted Trousering.

No. 534.

Warp :—

12 ends	Black worsted 2/50's.
11 "	Drab " "
1 end	Blue " "
1 "	Crimson " "
11 ends	Drab " "
12 "	Black " "

\* Design.

11 ends Drab " "

Straight draft.

12 " Black " "

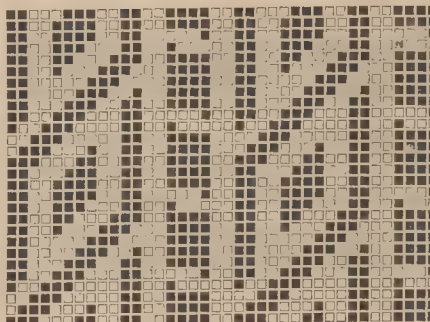
Pegged to fall.

Weft :—25 skeins woollen.

4,770 ends in warp; 20½'s slay; 4 ends in a reed; 82 ends per inch; 46 picks per inch; 58 inches wide in the loom; 52 inches wide when finished. Finish clear and smart.

Weight 12½ ozs.

No. 538.

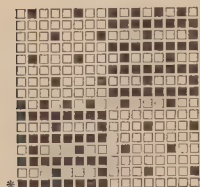


### Piece Dyed Mantle Cloth or Coating.

No. 535.

Warp :—2/32's Grey worsted.

Weft :—1/12's Grey worsted.

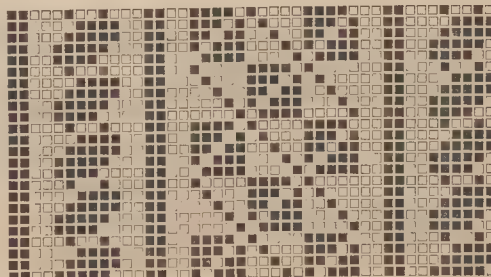


\* Design.

4,320 ends in warp; 18's slay; 4 ends in a reed; 60 picks per inch; 60 inches wide in the loom; 52 inches wide when finished. Finish smart and clear. Weight 18 ozs.

Straight draft. Pegged to fall.

No. 539.



### Cotton Dress Goods.

The following are designs for Cotton Dress Goods. They vary from 16 shafts upwards. For the purpose of showing more plainly the formation of the pattern, we give a little more of some of the designs than is necessary. The limit of each design will be easily understood.



## MACHINERY, &C.

### Loom with New Selvage and Split Motion.

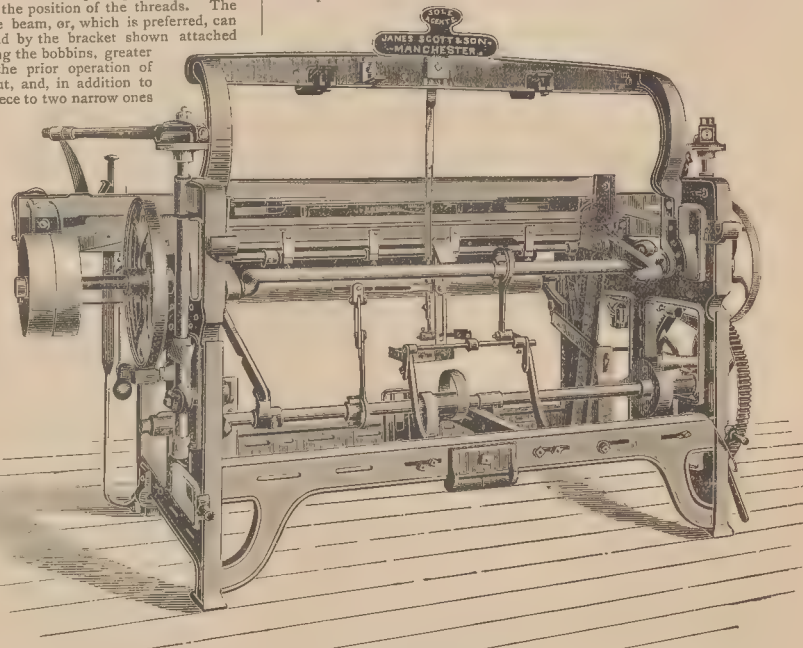
In manufacturing, it is sometimes the practice to weave what are known as "splits," that is, pieces which, being woven on the same loom simultaneously, can be easily divided into two distinct pieces. In order to effect this, it is necessary that, in addition to the ordinary selvages at the outer edges of the pieces, there should also be one at the inner edge of each of the two. The formation of this selvage is a somewhat difficult matter, and has led to a good many ingenious contrivances. In some cases, it has been found necessary to cut down the heads in the middle of the loom, and the mechanism employed has been so large as to cause a great division of the warp. The latter leads to irregular weaving, as, the warp threads being crowded together, there is not that straight appearance in the cloth which should exist, the picks not being well put in. The illustration given herewith, which is a back view, shows the mechanism very plainly, and it is clearly seen how little space it occupies. The space between each piece is one dent only, and the rod by which the warp is split is so narrow as to cause practically no disturbance in the position of the threads. The leno threads can either be wound on the beam, or, which is preferred, can be carried on two bobbins, which are held by the bracket shown attached to the bottom cross stay. By so placing the bobbins, greater facility is given for piecing up, and the prior operation of beaming is much more easily carried out, and, in addition to this, the change from weaving a broad piece to two narrow ones can be more readily made.

Two of the leno threads are passed through eyes in the upper portion of an oscillating slotted lever, which is pivoted to the bracket shown, and derives its lateral oscillatory motion from the eccentric shown as fixed on the tappet shaft. This eccentric is made in two pieces so as to be adjustable, and any necessary throw can thus be given to the lever. The other two leno threads are passed through eyes in the upper ends of vertical rods or reed hooks, which are given an upward and downward movement by an eccentric fixed on the crank shaft. This eccentric is also adjustable, so that the reed hooks can be moved through a greater or lesser distance as desired. As the shed is formed by this vertical movement, a close or open one can be given at will as required. The reed hooks are sustained by the rod which splits the warp. When the loom is working with this attachment, the two threads passing through the oscillating lever are moved from side to side at each pick, and the two in the reed hooks are raised and lowered alternately. In this way, the weft is wrapped right round each pair of leno ends, which are locked together by it in a most perfect manner, and a selvage, which is as good as possible, is produced.

The whole motion is very simple, but wants illustrating by diagrams to be clearly understood. These it is not necessary to give, as the makers will be glad to afford facilities for inspection to any manufacturer. The advantages arising to the latter from this motion are very obvious. In these days, when all sorts of strange demands are made upon them, it must be decidedly better to be in a position to weave either narrow or broad fabrics with equal facility. It is only necessary, in making the change, to take away or fasten a bracket, which can be done in less than five minutes. Of course, to take full advantage of this motion, it would be necessary to have a broad loom, the first cost of which is about £2 greater than an ordinary 39 inch loom. This is amply compensated for by the provision which then exists for weaving various widths of cloths, and, in many ways, broad looms are more economical than narrow ones, if they can be kept fully employed. By the adoption of "Simpson's" motion, the simplicity of which is its chief merit, the option is given to manufacturers to accept orders for various widths, with a certainty of being able to produce them at a low cost, and there is not any doubt that the money expended in its purchase would soon be recouped. The motion is positive in action, which is a decided advance, and is well and strongly made. For further particulars apply to the sole agents, Messrs. James Scott and Son, Manchester.

### New Stop Motion for Yarn Twisting and Doubling Machines.

Numbers of stop motions, to prevent the making of faulty yarns, are now being made by those engaged in the textile machine industry, all of which possess more or less merit. One of the latest patents of this class of mechanism was completed recently by Messrs. John Sykes and Sons, Turnbridge Ironworks, Huddersfield, and judging by its apparent simplicity, considering the work it has to perform, it ought to meet with more than ordinary attention. Faulty yarns, caused by breakage of threads, are still far from uncommon, and these defects, as is well known, not only entail a loss to the spinner, but are a source of trouble and vexation to the operators in the other branches of the textile trades, but with an effective stop motion these faults can almost be obviated. We presume that the majority of our readers understand the spinning mechanism as now in common use, and as this motion can be generally applied, the following description of it will give a good idea of its utility. In carrying out the invention, the upper feed rollers are borne by a horizontal frame, capable of oscillating when the yarn thread breaks, for the purpose of lifting them out of contact with the bottom feed rollers, and stopping the delivery of the yarn. The rear end of this oscillating frame is supported by a second frame placed at right angles with the former, which is also capable of oscillating. This latter frame carries eyelet pins, placed vertically in it, these pins being supported by the travelling threads, one by each thread, so that, if a thread should break, the wire drops sufficiently low to be caught by wings or arms projecting from a rotating shaft in such a manner that the pins are seized by these wings, and the vertical frame is caused to



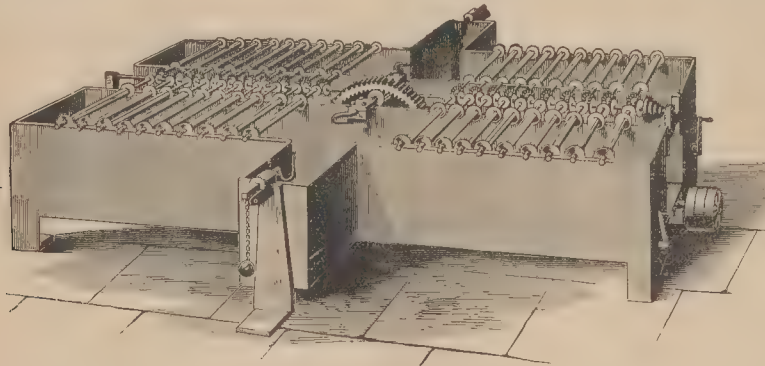
Loom with new Selvage and Split Motion.

oscillate, and is disengaged from the rear end of the horizontal oscillating frame, allowing this end to descend, and causing the front end to be raised so as to lift the upper feed roller from contact with the bottom feed roller; the upper roller then travels towards the rear end of the horizontal frame, the weight ensuring the descent of the horizontal lever, and causing a vertical rod attached thereto to disengage the bobbin driving mechanism, and immediately to stop the bobbin from rotating, this occurring at the time that the feed rollers cease to deliver the yarn. The above only applies to the breakage of the threads in a position behind the feed rollers, but self-acting mechanism is applied for stopping the delivery of yarn when it breaks at the front of the machine, or at a point between the bobbin and the feed rollers. For this purpose, the yarn passes through an eyelet made in the end of a lever carried by the thread. This lever is centred, and carries at its other end a vertical pin which passes through holes made in the vertical oscillating frame, so that, on the thread breaking between the bobbin and the feed rollers, the front end of the lever is freed, allowing it to ascend, when the pin at the end descends and comes in contact with the winged shaft, setting in motion the mechanism above described. In the practical working of the machine, it is found that, whenever it is stopped, the threads continue to travel some little distance, in doing which there is necessarily some slack of yarn between the delivery

bobbins and the feed rollers, such slackness allowing the eyelet wires to descend so that they would be in contact with the winged shaft, in which case the machine could not proceed. To prevent this, a stop rod is employed to disengage the winged shaft with a driving clutch, so as to prevent the wiper shaft from rotating; as soon, however, as the machine is set in motion, and has taken up the slackness of yarn, in order to lift the eyelet pins beyond reach of the winged shaft, the stop rod is operated so as to engage the winged shaft with the driving clutch, allowing it to rotate and to be ready for the descent of any single pin when a thread breaks.

### Spencer's Patent Hank Dyeing Machine.

In the dyeing of cotton, wool, linen, silk, and other fibrous yarns, many improved machines have been put before users during recent years by makers of dyeing mechanisms. As in all other branches of the textile industry, the object aimed at in these improvements has been the production of apparatus that would do its work efficiently in as short a time as possible, and with the greatest economy. No doubt, many recently patented dyeing machines have their faults as well as their good points, but the former are now few, owing to the continued experiments that have been made in order to ensure satisfactory results. Recently, we have seen a number of machines that have been made for the special purpose of dyeing yarns in the hank, one of which was at the works of Mr. Samuel Spencer, machinist, Whitefield, near Manchester. From the annexed illustration, it will be seen that the leading features of the apparatus consist of a series of arms, which are put into motion by the revolving of a centre arm. The yarn is put upon the arms, which are then set in motion, the movement having the effect upon the hanks of being turned over by hand, and any tendency to "ravelling" is obviated. The machine is made double, having arms on each side, this



Spencer's Patent Hank Dyeing Machine.

method yielding a larger percentage of work for a given expenditure of power than is obtained from apparatus generally in use. With a machine having five arms on each side, four bundles of yarn, two on each side, can be dyed with no more liquor than in an ordinary tub. When the hanks are put upon the arms, the tank or box containing the liquor is raised to the yarn by a lever, the machine is set in motion, and the process of dyeing commences immediately. An ordinary sized machine will dye 8 to 12 bundles of yarn per hour, in a perfectly level manner, as the hanks are all revolving at a uniform speed. The apparatus can be made with any required number of arms, so that the dyeing can be done on either a large or a small scale. Attached to the machine is an "alarm," which can be set to give any number of turns to the hanks, or set to any length of time. This is a decided advantage. A patent wringing apparatus can also be affixed. Mr. Spencer will give particulars and prices of different sized machines on application.

### Holden's Assisted Draught Furnace and Smoke Prebenter.

We have lately been afforded an opportunity of inspecting the working of a decidedly improved form of Assisted Draught Furnace, in which, by a happy combination of several good detail features, an excellent result is obtained. The invention is that of Mr. J. W. Holden, of Manchester, where many of these furnaces have been satisfactorily at work for some time past. In fact, the principle has been thoroughly tested there, and it has now been applied, for the first time in London, to four boilers at Mr. Wm. Whiteley's extensive establishment in Westbourne Grove, Paddington. The way in which Mr. Holden assists the draught, and prevents the formation of smoke is very simple. Air is admitted at the mouth of the ashpit, and passes on to the bridge at the back. It then enters the hollow fire-bars, and so returns to a small chamber under the furnace door and dead plate, absorbing heat from the fire-bars on its way. The heated air then passes up through passages, one on each side of the fire-door, to a chamber over the fire-door, where it is delivered into the furnace through the short tubes, best seen in Fig. 2. In the chamber, and just behind each of these tubes,

is a small steam jet controlled by a cock outside, and through which live steam from the boiler can be admitted at will. This creates an induced current, and draws the air in rapidly, delivering it with great velocity into the furnace, thus effecting the immediate and thorough combustion of the gases arising from the burning fuel. The boilers at Mr. Whiteley's are of the Lancashire type, 30 feet long, by 7 feet diameter, with 2 feet 9 inch. flues, and 6 feet furnaces. At the time of our visit, the coal used was Hartley main, a capital smoke producer, but on firing up both furnaces, and using the steam jets, all that could be detected was some three or four short puffs of very faintest brown smoke, which the Smoke Abatement Society would probably designate shade No. 0 of their scale, for it certainly did not reach what we have seen designated as their No. 1 shade. A 70 lb. steam pressure was not only easily maintained, but had now and then to be kept in check, as it made the run to 76, and 78 lbs. The fire-bars were 5 inches deep, by  $1\frac{1}{2}$  inch broad at top, and  $\frac{1}{2}$  inch at bottom, and were spaced about  $\frac{1}{2}$  inch, but the spacing is varied to suit the character of the coal used. It will thus be seen that Mr. Holden's invention comprises a combination of hollow bars, hollow dead plates, air chamber, and ejector tubes, varying in number to meet the requirements of chimney draughts, and fitted with fine steam jets. Among the other advantages claimed for this furnace are the following:—It increases the draught in the ashpit, which quickens and more thoroughly supports the combustion of the solid fuel on the bars. It supplies, and effectively distributes, a constant current of heated air above the fires, effecting the instant combustion of the gases arising from the solid fuel. It secures the absolute prevention of smoke, greatly develops the heating power of the coal, and largely increases the economy and speed of evaporation. It also secures facilities for regulating or increasing the velocity of the draught necessary for the varying states of the fires, either during light, heavy, or irregular firing. It, moreover, utilises the waste heat taken up from the bars, also that which otherwise radiates through the furnace fronts. It likewise economises the fireman's labour, relieving him

to a very great extent from stirring and forcing his fires, and enabling him to clean out with ease and rapidity. The bars and air chambers are always kept cool by the constant and rapid circulation of air through them, which prevents them fusing, or the clinker adhering to them, and greatly lengthens their life. At all times, whether in use with or without the steam jets, this furnace unquestionably increases the draught in the fire-bars, and below the solid fuel, and supplies a current of heated air above the fuel. When in use without steam, the air enters the bars and air chambers, and becomes heated and rarified, and the unbalanced pressure of the heavier atmosphere outside forces it forward, creating a constant circulation of air down the ashpit, through the bars and air chambers, and which is expelled above the fire at a high temperature, effecting more rapid and complete combustion of the solid fuel on the bars, and, after making the circuit of the bars and air chambers, is ejected over the fire at a temperature and velocity which secures perfect and instantaneous combustion, and prevents the formation of smoke. The draught and the requisite velocity are obtained at a minimum of cost, while the advantageous method of utilising it effects the rapid and most thorough combustion of both the solid and the gaseous fuel, and develops to the fullest extent the evaporative economy of the coal, and the maximum power of the boiler. Whilst many theorists affirm that a due admission of air will prevent smoke, there are still people who cannot be persuaded that smoke can be prevented. Neither of these conclusions, however, is either satisfactory or correct. By admitting the quantity of air theoretically required to ensure perfect combustion, smoke may be prevented by careful firing, where only a moderate evaporation is required; but wherever boilers are worked up to their maximum power, and a large quantity of coal is necessarily to be burned, the velocity of the natural chimney draught is almost inadequate to fully develop the evaporative power of the coal or to prevent smoke. Under these conditions, it is absolutely necessary to adopt special means to secure the requisite velocity of draught, without which it is impossible to effect satisfactory combustion, and to prevent the formation of smoke. If the highest economy is to be obtained, it is also indispensable that there should be two currents of air, one below, and passing through the solid fuel, and the other above the fuel, heated by the waste heat, and supplying the oxygen necessary to support the combustion of the gases arising from the burning fuel. It is to successfully meet these requirements that the

"Assisted Draught Furnace and Smoke Preventer" was designed. The first of these furnaces was fitted up at Messrs. E. Green and Sons, Economiser Works, Wakefield, where it continues to give every satisfaction. At Messrs. Thomas Barnes and Sons, Moses Gate, Manchester, whose No. 4 mill is fitted complete, the diagrams taken from Moscrop's indicator, in the place of shewing the continued zig-zag, now show a straight line from week end to week end, while there is said to be an appreciable economy in the coal consumption, smoke being entirely prevented. At Messrs. Peoples and Son's Paper Mill, at White Ash, all the boilers were fitted with this furnace, with the specific object of increasing the fixed power of the boilers, and this object was attained so completely that the firm have had their mill at Rushton similarly fitted up. These are cases where the furnaces are notoriously heavily fired, and they exhibit striking examples of this boiler furnace being literally smokeless. The Holden furnace is also fitted to the boilers at the office of the "Manchester Courier," where a high pressure of steam is easily maintained with a decreased consumption of coal and prevention of smoke. These are a few instances where the Assisted Draught Furnace has been fitted to land boilers; but this furnace has secured results of equal importance in marine boilers. The first vessel fitted up was one having six furnaces, and running from Newcastle to Spain and Italy, and it is stated that the unusual event was witnessed of six furnaces burning the notorious north country coal with hardly a suspicion of smoke issuing from the funnel during the whole of the voyage. The intense draught which the Assisted Draught Furnace secures also renders combustion less dependent on the funnel, or chimney draught, a steady pressure of steam being maintained when running with the wind, or in calm sultry weather, thus saving the firemen the exhausting labour of freeing and pricking their fires. The vessel is also said to have made both the outward and homeward run in a shorter time than previously, whilst she had a larger quantity than usual of coal on her arrival home. This was considered such conclusive evidence of increased speed upon the minimum cost of fuel that the owners at once decided to fit up other vessels with the Holden Furnace. In the case of a vessel running out of Liverpool having plenty of boiler power, the engines could not take the extra steam generated by this furnace, and it resolved itself into the question of economy of coal consumption and smoke prevention. In this it is stated to have been eminently successful, showing a noble saving, and entirely preventing smoke. Owing to its capabilities for greatly increasing the rate of evaporation and the power of the boilers, it has also been fitted to a vessel running out of London in the tea trade, in which speed is the one thing to which everything else is made subservient. Our examination of the Assisted Draught Furnace and Smoke Preventer leads us to the conclusion that it is simple in construction, does not necessitate any radical change in the boiler, and requires no skill to work it. We consider it to be a rational and practical method of dealing with the problems which it has successfully solved. We should add that the manufacturers are Messrs. G. H. Holden and Co., Carr Street, Blackfriars, Manchester.

#### Messrs. Dobnham and Co., Engineers, Bury.

This firm, who recently commenced business as makers of machinery for bleaching, dyeing, finishing, calico printing, &c., are erecting works in Bury, where they intend manufacturing high-class machinery, of the latest type, for the above industries. The works, which are to be called the Barnbrook Ironworks, are to be situated in Fountain Street, near to the Barnbrook spinning and weaving mills, and, when finished and in full operation, labour can be found for 150 men. The foundations of the structure have been already laid, and the work of erection is being pushed forward as rapidly as circumstances will permit. The main building, which will be 150 feet long by 60 feet wide, will comprise that portion of the Manchester Exhibition buildings which formed the north nave. A prominent character will be given to the structure by the addition of strong brick walls, in which are to be embedded the pillars carrying the roof. This arrangement will make an erecting shop, having good head room and light required for the construction of the above machinery. A large travelling crane will be erected, having a span of 35 feet, and placed about 24 feet from the ground. This will be worked by an endless rope, and will be self-acting in all its motions, and capable of lifting 15 tons. The space not occupied by the larger crane will be covered by a gallery for the erection of light machinery, a pattern making shop, &c. Under this gallery light lathes and other machines not requiring the use of the travelling crane will be placed, while under the travelling crane itself heavy lathes, planing machines, slotting machines, and radial drilling machines will be put down. A new steel boiler, to work at 100 lbs. pressure, is being supplied by Mr. William Lord, Lord Street Boiler works, Bury, and the construction of a horizontal condensing engine has been entrusted to Messrs. John Musgrave and Sons, of Bolton. The whole of the works are to be fitted up with new tools of the latest designs, made by eminent Manchester makers, amongst whom are Messrs. Kendall and Gent, Hulme and Co., W. Muir and Co., and Vaughan and Sons.

According to the report of the Barmen Chamber of Commerce, the year 1887 was anything but a prosperous one for the silk manufacturers of that town. Owing to the apprehension of political complications occurring with France, the stocks remained very heavy until the end of April, and at the same time prices went down, and although they revived for a short time in August, the market was very weak at the close of the year. The demand for good qualities was stationary, and, in cheap goods, the competition of the Swiss manufacturers is severely felt. Owing to the import duties, Russia and the United States are almost closed against the silk products of Barmen.

#### Consular and other Reports.

Consul Scott of Ningpo (China) draws attention of home machinery makers to the apparatus used at that place by those engaged in cotton ginning, he says:—"A considerable portion of cotton produced in the immediate neighbourhood of Ningpo, is now ginned by means of ginning machines imported from Japan. These machines, which have already been mentioned by Mr. Cooper in former reports, are manufactured at Osaka in Japan, and, whether a Japanese or a Western invention or adaptation, are of a distinctly foreign type. It was about two years since the first was introduced here, really under Chinese auspices, but ostensibly, and to discount any opposition to them that might arise from the people or officials, under the protection of Japanese. The success obtained by these machines has induced certain Chinese to import others, and to establish a large ginning establishment on the bank of the river, some two miles from the city wall. The most important aspect of this movement is, however, that while the machines hitherto imported have been treadle machines, to be worked by one operator, the Chinese above mentioned, with the consent of the local authorities, have imported much larger machines and the necessary boilers and engines to drive them by steam power. At this ginning establishment, when visited a short time since, about 30 of the smaller machines were at work, and the engine and boiler were being placed in position. Should this venture meet with no opposition, it will be the first successful attempt, so far, to introduce power machinery for industrial purposes into China, apart from the Government arsenals, coal mines, and steamships, in which foreigners have no share. The iron castings of which these machines are made, both the body and the main and subsidiary fly-wheels, although somewhat rough, are good and substantial, and they appear to do their work well and smoothly. The value of the invention, or rather, perhaps, the adaptation of the principle of the simple hand machines used for ages by the Chinese—and, probably, by the Japanese—consists, it is said, in the fact that the seeds are extracted from the cotton, as in American ginning machines, not by means of saws, but by drawing the cotton between straight steel edges of knives. The cotton is fed by hand into the machines; by the movement of the machine a small portion of fibre is then squeezed between the lower moveable straight edge, having a vertical movement, and the fixed upper one. The fibres of the cotton are then caught on a revolving drum of wood faced with strips of leather, placed close together diagonally. The edges of these strips are sufficiently rough to hold the cotton, which is gradually drawn between the moveable and fixed steel edges, and the seeds are extracted. I am informed that it is almost certain that two great advantages attend this method of ginning, as compared with the method used in America:—(1) The staple is less cut and injured; (2) the seeds are, apparently, better cleaned. There can be no doubt that these machines are a vast improvement on anything used for the purpose in China, both as to the speed and the quality of the work done. It seems probable that in a few years they must—that is, the smaller machines—come into general use throughout the cotton-growing districts of China, and a very large demand for them must arise—a demand that, if the principle is really of the excellence suggested, will not be confined to China, but will extend to America, India, Egypt, and all cotton-growing countries. It would seem that the invention is one worthy the immediate attention of our home machinery manufacturers."

Consul Woodbridge writing from Barcelona, says:—"I have not observed that during the year the practice of German manufacturers of sending young men out here to ascertain the needs of the people, to learn their language and industrial powers, and thus to turn the information they may obtain to the account and advantage of their employers, has been followed by the English manufacturers, though, no doubt, the latter would be able, with English goods, to compete with Spanish manufacturers. Of course, we must expect imitation and competition from this very industrious and intelligent people, but we have something worse than that now; they do not imitate for the sake of imitating English goods, for their colours, designs, &c., are produced from the brain and the natural taste of the people; but they put up the native wares for sale as English, and neither patents

nor trade marks will protect our goods, nor prevent the Catalonians from imposing their wares as English make and English production. Real superior woollen and cotton goods like the English are not to be manufactured here, which, on account of their higher prices and quality, show they are English, and any fraud of the kind would soon be detected if superior Catalan goods were offered as English with their higher prices."

A merchant writing from Canton (China), says:—"Here as elsewhere, it is an alarming fact, so far as we are concerned, that native industries are supplanting ours. Much as you people in England have talked about South China, you have done nothing to open up the market. Travellers may come and travellers may go, but what we want here are commercial agents who know the 'ropes.' There are plenty of them to be found if necessary. German firms, at any rate, pick them up by the dozen. One of these men is worth a dozen explorers who lecture before Royal Geographical Societies. In China, as in every other place, you require really smart men to keep you acquainted with what I may call the latest tips. Let me give you an illustration of what I mean. One of your consuls told you some time ago that Chinese cotton goods wear and stand hard work better, can be patched oftener, and, when worn out, come in more useful for the soles of Chinese boots than foreign goods. Your manufacturers were told, and with great truth, that if they wanted to do business they should manufacture an article soft, durable, easily dyed, and easily mended. There is an immense market ready to consume any available goods, but, in spite of the warning advice given to you, things have not improved lately. The fact is, trade is affected by what I may call freaks. As an instance, I remember, some time ago, handkerchiefs decreased by 2,500 dozens, owing to the fact that the soldiers ceased to use blue foreign pocket-handkerchiefs to wind round their heads in a kind of turban, a black rag of native make being substituted. This is just an example, and hundreds of them could be given where the need of commercial agents is apparent. Teach your people that truth, and you will have taught them all."

**TRADE OF COREA.**—The report upon the trade of Corea during 1887, prepared by the British Consul at Seoul, exhibits a remarkable increase in the foreign trade of that newly opened country. The imports reached £541,761 against £466,250 in 1886, and the exports £187,164 against £104,753 in 1886. The fact that these figures comprise merchandise only explains the wide difference between the imports and exports, the balance being made up of exports of gold. Of the imports, not less than £314,083 consists of cotton goods, chiefly shirtings, of which 492,099 pieces were received, against 389,178 pieces in 1886. Of woollen goods, the imports were considerable. Japanese silk manufactures were imported, however, to the extent of about £28,000. Besides the natural tendency to increase in the trade of a newly established market, the chief cause of the augmentation shown last year was the excellent harvest which was reaped all over the country. The total revenue raised from Customs duties was £41,117 in 1887, and £26,713 in 1886. The Government has lately set up a mint, the machinery of which was supplied from Germany, through a German firm recently established at Seoul and Chemulpo. A line of telegraph is to be made to connect the capital with the port of Fusan, the metallic requisites for which are ordered from Germany. The King's palace has been furnished with the electric light. The trade of Corea is almost entirely conducted in the first instance with Japanese ports, through which the supplies from Europe are received.

**THE EFFECT OF RUSSIAN CUSTOMS DUTIES ON BRITISH TRADE.**—The increases which are constantly being made in the Russian tariff are having, as is only to be expected, a serious influence in preventing imports into Russia, and German trade has suffered severely in consequence. Consul-General Grant of Warsaw, in reporting on the trade of last year, points out that the trade with Great Britain has also decreased, there being a noticeable falling off in fancy cloths, Manchester cotton velvet, jute, felt carpets, cocoa-nut mattings, Nottingham curtains, leather and cotton beltings, Birmingham goods, Sheffield cutlery and tools, agricultural machinery and implements, leather for bookbinders, earthenware, and glass. There is also a decrease in cotton yarns and twist, knittings, Irish linen, chemicals, and aniline dyes. The only articles which seem to have held their

own are power-looms and spinning machinery. The Consul-General states that in consequence of the diminished importation of foreign manufactured goods, many small manufacturers in Warsaw have lately taken to producing articles which were formerly obtained from abroad, such as pins and needles, leather goods, umbrellas, cravats, silk ribbons, stays, &c.; also silk, cotton, woollen, and kid gloves; felt and straw hats, small iron wares, tin goods, buttons, ready-made clothes, knitted goods, musical instruments, toys and dolls, basket goods, and carpets. Warsaw is, in consequence, rapidly becoming an industrial centre.



### ODDS AND ENDS.

The *Moniteur de la Mode*, reviewing the Paris fashion, says:—"The colouring of the batistes, zephyrs, lawns, cambrics, pongees, and light summer materials offers an exhaustless gamut of shades, which vie with each other in beauty. The most beautiful flowers of hothouse or garden, orchids, azaleas, roses, rhododendrons, &c., have been pressed into the service to offer examples of blues, reds, pinks, mauves, and yellows, to be copied on materials."

With reference to the correspondence to which publicity was given on the 31st March last, concerning the Merchandise Marks Act and the Australian Colonies, Mr. E. Johnson, F.S.S., hon. secretary of the London Trade Marks Committee, and manager of the Trade Mark Protection Society, has been informed by the mail just delivered from Sydney, that the Hon. J. E. Salamons, Q.C., Vice-president of the Legislative Council, has given notice that it is the Government's intention to introduce the English Merchandise Marks Act, which will include other cognate Acts, and repeal the present antiquated colonial statute.

Glasgow appears to have taken the lead in the adoption of a system of automatic telephone boxes. There are 76 of them scattered about the city, to which subscribers have keys. When a non-subscriber wants to use the telephone, he first rings up the exchange and ascertains whether the desired connection can be made. If it can, the fee, of three or six pennies according to the distance he wants to talk, is dropped, one by one, into a hole in the box. The pennies, as they fall, break a circuit and ring a bell at the central station, and if the required number is announced, the central office makes the connection. At the end of three minutes allowed for conversation, the connection is automatically broken. The average time taken to put two persons in telephonic communication in Glasgow is 35 seconds, in Birmingham 40, in Liverpool 32, and in Dundee 20.

The report of the Stuttgard Musterlager, or Export Agency, for 1887-8 again gives a favourable account of the results of that experiment. The members now number 320. The visitors during the year numbered 210, mostly foreigners, and of these 196 became buyers. The number of orders received was 1,405. The report says that although these figures, representing verbal and written orders, show only a slight increase, yet the value of the goods shows a further expansion of 10 per cent., as, instead of the small sample orders which were the rule during the first year of the Agency, regular orders are now received from a large number of firms who order nearly all their requirements of German productions through the Agency. By strict adherence to the rule of cash payments, the members have been guarded against any loss on business done through the Agency.

We referred some time since to the efforts which were being made by the German Jute Spinners' and Manufacturers' Association to promote direct trade with India, and stated that the President of the Association, Herr Spiegelberg, had undertaken to make inquiries, during a visit to India, on his own account. We find in *Industries* an abstract of a report which Herr Spiegelberg has submitted to the Chancellor since his return. He recommends the establishment of a direct line of steamers, mainly for the purpose of increasing the export trade in jute goods, the present method of shipping via London being too costly and cumbersome. But there are also other reasons. Herr Spiegelberg has found that in various parts of India there is a strong demand for German manufactures, and that German woollen goods are especially in request in Northern India, where they compete on favourable terms against English goods. The import of German salt into India would also appear to be a promising business. In addition to these advantages, which would result from a direct line of steamers, Herr Spiegelberg points out that there would be the advantage of increasing German prestige, and promoting the establishment of a German bank in India.

## PATENTS.

## Applications for Letters Patent.

Automatic equilibrium sprinkler. J. B. Adams, London.	25th June	9,246
Ageing and preparing raw cotton, &c. S. Mason, London.	28th June	9,430
Artificial wool from ramie, &c. R. Haddan, London.	22nd June	9,145
Actuating mechanism of dabbing brushes. E. Bottomley, H. Lister, and G. Thewlis, Bradford.	23rd June	9,178
Buckles for check-straps for looms, &c. J. Smith, London.	11th June	8,540
Bed for "Jerries" or other cloth cutting machines. T. T. Clegg, Huddersfield.	12th June	8,577
Backing-off motion of self-acting mules and twiners. J. Clegg, Manchester.	15th June	8,774
Balling or winding for forming balls of fibre for combing machines, &c. C. and J. H. Whitehead, London.	27th June	9,372
Cylinders for drying yarn or cloth in sizing and drying machines. St. J. V. Day, Glasgow.	30th May	7,899
Construction of dobbies. W. Warrington, Manchester.	7th June	8,308
Cellular or similar cloths. L. Haslam, London.	7th June	8,328
Coir yarn mats, &c., and machinery. E. Hodder and R. Swain, London.	11th June	8,537
Chenille-weaving chenille or velvet carpets, &c., in a plain or jacquard loom. R. Cochrane, London.	12th June	8,615
Combing machines. H. L. Offermann and G. Ziegler, Manchester.	14th June	8,714
Consuming smoke and economising fuel. J. E. Hall, London.	16th June	8,852
Carding machines. G. Josephy, London.	25th June	9,235
Colouring matters for dyeing and printing. C. Dreyfus, Manchester.	26th June	9,281 and 9,281
Cloth cutting machines. G. J. W. Galster, London.	26th June	9,284
Consuming smoke. R. H. Mitchell, London.	22nd June	9,133
Drying wool, &c. J. Bradshaw, Huddersfield.	12th June	8,576
Dyeing or painting on fabrics, and apparatus. C. and H. Dratz, London.	20th June	9,044
Drawing-off rollers for combing. J. Brook and J. Taylor, Bradford.	21st June	9,068
Detent brake for spinning and doubling spindles. J. M. Hetherington, Manchester.	21st June	9,070
Dyeing and scouring yarns in hank. J. Amers and P. McLean, Galashiels.	22nd June	9,105
Doffing bobbins from spinning and doubling. H. Lowe, Manchester.	28th June	9,410
Drying and ageing spun cotton, &c. S. Mason, London.	28th June	9,429
Doctoring rollers or appliances of calico printing, &c., machines. J. Kerr and M. Handley, London.	22nd June	9,135
Embroidery machines. H. E. Newton, London.	5th June	8,231
Easing the setting on of straps for mules, &c. T. Doleman, Oldham.	12th June	8,582
Fancy lace. A. T. Wootton and W. Clifton, London.	30th May	7,928
Fringing machines for making ornamental stitches and edging or fringing. W. Fairweather, Manchester.	5th June	8,174
Fabrics of animal and vegetable fibres mixed, dyed black. T. Holliday, London.	11th June	8,530
Fustian cutting knives. J. Wilkinson and T. Fazackerley, Manchester.	15th June	8,779
Frames for packing imitation sealskins, &c. J. Jowett and J. Campbell, Bradford.	19th June	8,499
Facilitating and securing greater accuracy in the adjustment of flats to cylinders in revolving flat carding engines. J. Bullough, Halifax.	23rd June	9,170
Finishing and tentering pile fabrics. S. C. Lister and J. Reixach, Bradford.	28th June	9,456
Feeding "Noble's" and similar combing machines. F. T. Pollard and R. Atkinson, Leeds.	25th June	9,230
Gig mills. E. Michaelis, A. Smethurst, and C. Wood, Manchester.	30th May	7,896
Guiding, straightening, and covering selvages of fabrics for sewing. S. Arnold, London.	8th June	8,418
Grinding the revolving flats in carding engines. J. E. Platt and J. Fidler, Manchester.	27th June	9,382
Heating, drying, &c. J. Johnson, Manchester.	13th June	8,663
Hank dyeing. A. Rhodes and A. Crowe, Huddersfield.	19th June	8,967
Jacquard applicable to twist lace machines. G. H. Burnham, London.	21st June	9,077
Looms. T. Barnes, London.	31st May	7,995
Looms for ribbons, &c. A. C. Da Cunha Morace, London.	5th June	8,642
Looms. J. H. Kenyon, Halifax.	15th June	8,775
Letting off the warp in crank motions in apparatus in leno or selvage weavings in shuttle checks and cloth letting back appliances of looms. C. Catlow, Halifax.	15th June	8,776
Looms. W. P. Thompson, Liverpool.	19th June	8,989
Looms. E. Maertens, Bradford.	28th June	9,407

Looms for pile fabrics. E. Casper, London.	25th June	9,255
Looms. P. Whitaker and G. H. Barnes, Halifax.	25th June	9,239
Method of, and apparatus for, working fallers of fulling stocks for cloth, &c. J. Hustler, Bradford.	7th June	8,322
Measuring yarn and thread in winding, &c. W. Gallimore and S. H. Brooks, Manchester.	16th June	8,827
Machine made lace. T. L. Hameyer and H. Simpson, Bradford.	16th June	8,833
Metallic tubes and plates for internal fire boxes and flues of steam boilers, &c. R. E. P. Craven, Leeds.	19th June	8,927 and 8,928
Movable spindle for winding off bobbins. F. H. Roberts, London.	25th June	9,267
Permanent aniline black on cotton. W. E. Heys, Manchester.	6th June	8,250
Purifying water for wool-scouring, &c. E. Garside, Rochdale.	6th June	8,261
Preparing and spinning. H. and J. L. Broadbent, S. Holden, and R. Gregory, Manchester.	9th June	8,460
Picking motion of looms. E. and W. A. Rothwell, Manchester.	9th June	8,467
Prevention of accidents and breakdowns in the self-acting cotton spinning mule by means of a lever. E. Cross, Chorley.	15th June	8,781
Providing a positive and automatic regulator applicable to sectional warping and beaming machines. G. and F. Burgess and H. D. Ledward, London.	15th June	8,789
Picker motion for looms. H. J. Allison, London.	19th June	8,924
Preparing wool rags, silk, &c., for carbonizing. G. Tolson, Dewsbury.	19th June	8,934
Printing on fabrics. J. Kerr, London.	22nd June	9,124
Picker spindle of looms. E. Keighley, Halifax.	23rd June	9,175
Ring spinning. H. Mourey, London.	7th June	8,356
Ring spinning and doubling. A. W. Metcalfe, Halifax.	27th June	9,366
Self-acting mules. H. Whitman and H. Taylor, Halifax.	30th May	7,895
Shuttle guards. H. Greenwood, Halifax.	31st May	7,948
Self-acting mules and twiners. S. B. Errook and E. Kenworthy, Manchester.	5th June	8,212
Spindles for spinning machines and apparatus connected therewith. J. A. Hart and C. Baynes, London.	5th June	8,229
Self-lubricating loose pulleys, intermediate gearing, universal belt guide pulleys. B. Berry and G. and A. T. Jennings, Bradford.	6th June	8,247
Spinning fibres and twisting yarns. J. A. Leeming, Halifax.	6th June	8,257
Sectional warping and beaming. J. H. Stott, Manchester.	8th June	8,395
Self-acting mules. S. Marlor, London.	8th June	8,407
Shuttle operating mechanism for looms. R. S. Hattersley and J. Hill, Keighley.	15th June	8,773
Shuttle box motions. W. Smith, Manchester.	16th June	8,827
Spinning or doubling. W. P. Thompson, Liverpool.	19th June	8,984
Surfaces for printing and embossing, &c. J. Cumming, Portobello.	22nd June	9,111
Spinning flyers or attachments. J. Shaw, Bradford.	28th June	9,406
Shuttles for looms. J. S. Lodge and J. Turner, Huddersfield.	28th June	9,426
Selvage motions for looms. W. Smith, Manchester.	28th June	9,427
Self-acting spinning mules. J. Y. Johnson, London.	28th June	9,447
Tell tales for checking watchmen. H. Boardman Bradford.	26th May	7,720
Treating fibrous and other plants or fibres. J. Russell, Belfast.	18th June	1,880
Tappets for actuating heads in power looms. J. Knowles and J. Mercer, Blackburn.	19th June	8,937
Vertical mule spinner. H. T. Bardwell, Paris.	19th June	8,632
Yarn stretching. R. F. Watson, Glasgow.	26th May	7,733
Weaving chenille or fur pile fabrics and apparatus. W. Cochrane, Glasgow.	4th June	8,105
Waterproof linen. A. J. Boulton, London.	8th June	8,434
Winding yarns or threads on tubes or bobbins. J. Carigan, Manchester.	9th June	8,459
Woven driving belts. J. Jackson, Manchester.	22nd June	9,907
Winding yarns or threads. G. H. Holden and J. Ashworth, Manchester.	28th June	9,419

## Patents Sealed.

619	4,047	5,932	5,085	6,433	7,158	7,233	7,292
7,406	8,729	9,306	9,509	12,053	12,961	14,034	15,918
387	1,020	1,831	2,134	2,491	2,592	2,660	2,727
13,606	4,444	6,254	6,726	7,091	7,094	7,556	8,865
9,270	11,135	17,925	1,675	4,591	4,786	4,912	5,837
6,585	7,917	7,997	9,123	1,6080	3,337	3,468	5,929
7,911	8,111	8,265	8,325	8,330	8,422	8,514	8,525
8,832	9,136	16,589	1,830	2,608	2,922	3,331	3,587
724	3,802	7,407	7,454	7,528	7,549	7,734	8,364
8,504	8,535	8,604	8,783	9,027	9,456	13,220	16,024
3,104	3,457	3,774	4,102				

# The Journal of Fabrics

AND

## Textile Industries.

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### Notices.

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### Wool Impurities and their Extraction.

By "TEXTILE."

(Continued from Page 2, Vol. 14.)

The water used in scouring also claims consideration, as it plays no unimportant part in the cleansing operation, for, if it contains injurious foreign matter, not only does it neutralise the action of the soap, &c., and fail to act properly, but the foreign substances present may also form a sticky compound on the wool fibre, which will be found exceedingly troublesome to remove. The circumstances under which the water travels to the factory determines the quantity and, also, the quality of foreign matter present; thus rain water is purest, spring water of necessity contains more soluble matter than rain water (generally compounds of magnesium, calcium, potassium sodium, manganese, and iron, and in addition to these more or less of certain gases); river water contains less soluble matter than spring water, for two reasons—first, it derives most of its supply from surface drainage, and, second, being brought more in contact with the air, certain impurities are precipitated; but river water is deteriorated in quality, as a scouring water, by the amount of suspended matter it contains, which spring water (which is subjected to natural filtration) does not, being in this respect preferable. The terms "hard" and "soft" water really denote its action on soap, the former containing lime and magnesia

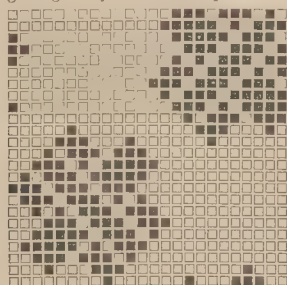
salts, which decompose the soap, thus, all the soap acted on by these salts is entirely wasted, and the scouring must be effected by what soap there is unneutralised by such action. In most cases, either boiling the water or bringing it in contact with the air will generally be found sufficient, but to rid it of all the impurities which may affect dyeing, other more complicated means must be resorted to. The last natural impurity, if such it may be termed, which it is desirable to consider here, is the natural yellow colouring matter in wool, and though this cannot be extracted, it can be bleached, *i.e.*, acted on in such a manner as to appear white. It has before been remarked that naturally white wools should always be chosen for white yarns, fabrics, &c., still it will very often be found necessary to bleach this class of material. This is generally done in the cloth state, but if white yarns are woven up with coloured yarns which will not stand bleaching, then the bleaching must be effected in the yarn state. The hanks or pieces (which must be wet) to be bleached, are hung up in the stove, which is simply a chamber or room with special contrivances for hanging up yarns, cloths, &c., all crevices being stopped to prevent the escape of the gas. Sulphur is then burnt, forming, with the air, sulphur dioxide; this gas combines with the water in the fabrics to be bleached, and forms sulphurous acid. The action of this on the colouring matter of wool is hardly decided yet, some authorities thinking it acts as a reducing agent, while others think that it combines with the latter to form a colourless compound. The pieces, &c., are often left overnight in the stove, and on being taken out are well washed in water. A continuous bleaching operation is used for thin fabrics by means of a stove, in which arrangements are made for the cloth to pass from the top to the bottom of the chamber over rollers as many times as space will allow, the damped cloth being thus subjected to the action of the sulphur dioxide for a considerable time, and it may, of course, be passed through as often as is required. Another method of bleaching is to employ a solution of sulphurous acid, steeping the goods in it as long as is necessary. Sodium bisulphide and hydrochloric acid are also used, either separately or together, the latter method being preferable, as the sulphurous acid will then act on the colouring matter of the wool in a nascent state, thus having a much more powerful effect than under any other circumstances. Wool bleached on this principle, for the time being, is as good a colour as is necessary, but constant washing with soap eventually seems to neutralise entirely the effects of bleaching. Though sulphurous acid is the agent generally employed for wool bleaching, there is another agent which, all are agreed, yields results far superior to those obtained by any other method, this is hydrogen dioxide, but here again the cost has prevented its use till recently, and even now it is not extensively employed, the only apparent reason being the expense. Having now dealt with the first class, *viz.*, natural impurities and their extraction, the second class, *viz.*, the true impurities, remain to be considered. In unscoured wool, there will always be found loose sand, dirt, &c., and also a certain amount of dirt fixed by grease; these can be readily dismissed with regard to their extraction, since both are readily extracted without any extra process in the scouring operation; the quantity present will depend upon the circumstances under which the sheep are reared. But there is another foreign matter which is not so readily dealt with, *viz.*, burrs (round prickly seeds about the size of a pea) which become entangled in the wool while the sheep are feeding in the hedge bottoms, &c. These are not present in all wools, but when they are, they must be removed, or else they will be torn up in scribbling into small fragments, and these will not only render the operation of spinning exceedingly troublesome, but, passing into the cloth, will require burling out, and thus materially add to the cost of the fabric. There are two ways to effect this, first by machine, second by extraction. The machine is generally used for the better classes of wool when the burrs are not broken up. The wool to be burred is carried by various means on to a revolving toothed cylinder; the burring rollers revolving in the opposite direction open the wool, till, eventually, the burrs hanging loosely on the surface of the cylinder are separated from the wool by means of a roller mounted with spiked arms. When the burrs are removed, the wool passes out of the machine by means of what is termed the delivering brush. There is another class of machine recently patented, which acts on an entirely different principle. The

burrs in this process are most effectively saturated with water, and then, passing through rollers, are efficiently pulverized. The perfect pulverization of the burrs is evidently the important operation here, for if this is not effected, as remarked before, the result will be disastrous. The extraction of burrs by sulphuric acid is the method generally employed for wools where the burrs are broken up and other fragments of vegetable matter are present. This method is termed "carbonizing;" the operation is conducted in either the loose wool or the cloth state. The wool, after being well scoured, is steeped for some time in dilute sulphuric acid (strength varying according to the quantity of burrs, &c., present). It is then taken out of the steeping tank, partially dried in the hydro-extractor, and placed in the dry-house, where all the water is driven off by heat; thus the sulphuric acid becoming concentrated, carbonizes the burrs, *i.e.*, it extracts the water from the burrs, and thus leaves little else but carbon, and as the burrs take up the concentrated acid, little or none is left to act on the wool. The wool is then rinsed in soda and water, or what answers the same purpose, is given another slight scour, which neutralizes any acid left, and is then dried, and after being left a time to regain its natural moisture is ready for use, when the carbonized burrs are knocked into fine dust in the various machines through which the wool passes. The acid has little or no action on the wool, unless it is to raise the scales which form the outer portion of the wool fibre, but cotton is very energetically acted upon (being a vegetable substance), and the extraction of the wool from cloth made of a mixture of cotton and wool depends upon these two facts. Chloride of aluminium and muriatic acid are also used for carbonizing, and when properly applied are said to give good results, still, sulphuric acid is cheap, and little or no damage is done to the wool if proper care be taken. Having dealt with both classes of impurities, we may add that, though the most important processes, &c., have been mentioned, there are many points which it has not been deemed advisable to touch upon, for the subject is endless, and still affords plenty of ground for research. In conclusion, the author would urge upon manufacturers the importance of keeping up with the times, and making good use of the appliances, &c., which science presents to them, for it is not those who know the most, but those who know how to apply their knowledge, who will eventually win the day.

### Satin Weaves and some of the Uses to which they are applied.

(Continued from Page 3, Vol. 14.)

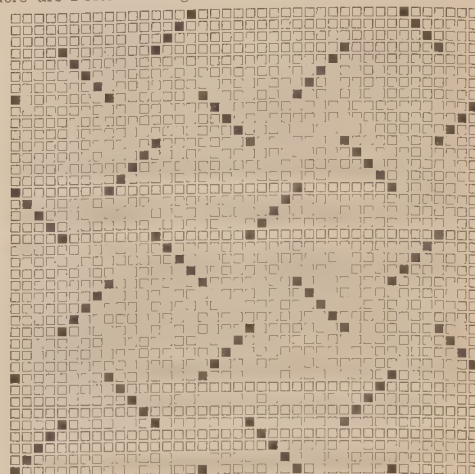
In arranging small figures of a geometrical character, satins are very largely and very advantageously used, for instance, in the case of Fig. 26, there are two spots set across one another, but this arrangement is very unsatisfactory, as we have the figures running diagonally across the piece at an angle of 45



26

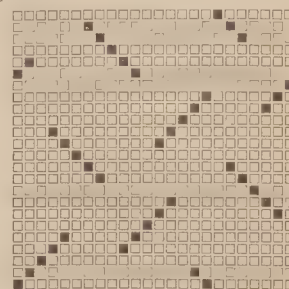
degrees, and the threads at the edge of each figure are working more nearly plain than those in the middle of the figure, and would become tighter than the rest, and have a tendency to produce "cockled" effects in the cloth; therefore, to obviate this, and to produce more equal distribution of the figures, satin order is resorted to, and having obtained the requisite space for each figure, care must be taken that in each diagonal of

figures, the figures are set across each other. In Fig. 27 is shown, by means of lines, the direction each spot should be in, so as to preserve this order of alternation. In this diagram, there are 4 sets of 5 figures, as, in one set, we should have 2



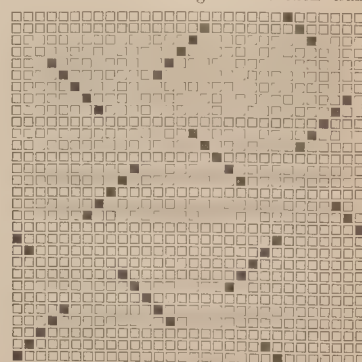
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figures in one direction and 3 in the other, therefore, the pattern must be extended to 4 times 5 figures, to allow an even number for the total, and to have each figure set across its neighbour. If this arrangement be carefully examined, we shall see that the



28

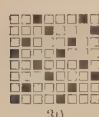
1st, 3rd, and 5th figures of the first set of figures are in the same direction, and the 2nd and 5th in the opposite direction; and in the second set of figures this arrangement is entirely reversed, and these two sets of figures are then transposed for



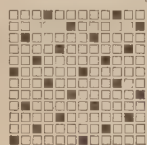
29

the third and fourth series. Fig. 28 shows a similar arrange-

ment for 8 figures. In this case, the figures are arranged in pairs, to achieve the same object as above. Fig. 29 is again a similar arrangement of 10 figures. Satin order is also very largely used for the arrangement of floral figures, but, in this class of figuring, great care has to be exercised in the filling up of the ground, so as, as far as possible, to avoid stripes either in the way of the weft, or of the warp; for this reason, the 4 end satin or satinet, and the 6 end satin are very often employed, as it is practically impossible to produce stripes by these arrangements. For the benefit of the uninitiated, these two irregular arrangements are appended, Fig. 30 being the 4 end satin, which is simply an



30



31

ordinary 4 end twill, with the 3rd and 4th ends transposed; Fig. 31, the 6 end satin, is partly arranged on a base of 2, with the 5th and 6th ends transposed. Satins are also used to distribute figures in gauze weaving, and some very pretty effects are also produced by having various

kinds of crossing, in satin order, arranged in such a manner that they interlace and bend the weft out of its course. Satin order is again indispensable in the manufacture of mohair and silk weft plushes, and in this class of fabric, not only must the series of plush picks form a plain pick with the ground, but these series must be arranged in satin order, so as to distribute the points where each series begin, and then each complete series must again be distributed in satin order, otherwise the binding place will show lines diagonally across the piece. In conclusion, we would draw the attention of the student, and the young designer, to the arrangement and use of satin orders in all their various forms, and we have no hesitation in saying that if he study carefully the uses to which he can apply them, he will be convinced of their great utility and advantage.

### The Manufacture of Velveteens, Moleskins, Corduroys, and Travisian Cloths.

On former occasions, we have had opportunities of putting before our readers particulars of cloths which have been manufactured under the names of velveteens, moleskins, corduroys and travisians, and particular notice has been drawn on two occasions to the fabrics made by Mr. David Madeley, 3, China Lane, Piccadilly, Manchester, who has, during recent years, secured himself a name for the above descriptions of cloths. At the Exhibition in Manchester last year, his exhibit drew much notice both from those interested in manufacturing and from the public generally, and an already large business has been much increased during the past twelve months as the result of the excellent display then made. Mr. Madeley has recently issued a pamphlet giving various particulars of the manufacture of his cloths and of corduroys generally, extracts from which will be of value to our readers. Speaking of corduroys and moleskins as formerly and now generally worn, he says:—"One hundred years ago, Manchester and Salford had a population of about 50,000 inhabitants. On reference to old Directories for the year 1788, there were about 270 fustian manufacturers, shearers, merchants, and others engaged in, or connected with, the trade. From this it appears that corduroys and moleskins were in those days not only largely worn but were approved articles of attire, being, in fact, the best esteemed apparel for all classes, rich and poor alike. But in those days, the goods were manufactured pure and sweet, free from, not only bone size but, every other ingredient which might by any possibility occasion a disagreeable smell either to the wearer or others. In these days, nearly all fustians dyed are saturated and stiffened with "bone size," the object being to make the goods feel of a more superior quality than they really are. All that is gained by this process is to deceive the consumer into believing that he has become the possessor of an article of greater thickness, strength, and durability than it really is, and inducing him to think that he is buying goods unsurpassed for warmth and cheapness.

The delusion, however, is not of long duration. In the course of the wearing of the cloth, when it becomes saturated with moisture,—whether from perspiration or rain matters little,—the artificial stiffening soon begins to give way, the cloth becomes hardened, then cracks, and finally becomes worn out, always accompanied with the disagreeable odour which is familiar to everybody who has once come in contact with bone sized goods. And here it is desirable to separate, for the reader's attention, the different classes of these corduroys and the people who wear them. It is singular that in England there are only two classes of people who wear them. The first of these classes comprises working people, who buy and wear the cloth believing in its durability, by reason of its having been stiffened by the bone size, to which reference has been made. The next of the classes referred to (and pardon is craved for placing them second on the list) is that which comprises the aristocracy and the gentry, or well-to-do people of our country. As regards the goods to which reference is now being made, there are but two distinctions. The first, or the poor, get the stiffened goods with the disagreeable smell, whilst the wealthy get the same material, made up into habiliments, no doubt, more elaborately and expensively, but to them it is ever free from the unpleasant odour referred to. It is well known that these latter gentlemen use garments of this cloth in hunting and other out-door sports, but be the weather wet or fine, they never return with their clothes evaporating an odour sufficient to sicken a household, or, indeed, a field of sportsmen. This is the result of the cloth being good, and finished pure. On the other hand, take the case of a railway porter; he is usually clothed in corduroy, and in nine cases out of ten this corduroy contains 33 per cent. of bone size. Many of these men take the precaution to have their clothes washed before wearing them, but those who do not adopt this plan always carry about with them a most disagreeable smell. And why should this be so? The railway directors insist upon the purchase of these goods saturated with this obnoxious size and smell. I am at a loss to understand this, as pure travisian cloth would cost less money, be sweet and agreeable to the wearer, as well as to passengers and others with whom he came in contact; and the durability of the cloth would be undoubtedly enhanced. And here it may not be out of place to remark that it will seem strange to the future historian to observe how, in this enlightened age, when there is such a fierce fight for economy and efficiency in every department of every public concern, it should never have occurred to the leaders of those corporations that, in buying fustian soaked with size for the men's clothing, the funds of the company are being wasted. The stiffening gives the cloth an evanescent appearance of soundness, but it causes its early decay, and injures the health of the wearer. That the nausea caused by the use of bone size can be tolerated even by the wearer is wonderful, but it is still more wonderful for it to be endured by those in higher places, who must know the cause of the evil smell, and that that cause is not an addition to, but a depreciation of, the value of the cloth. The same material, free from size, and consequently from a disagreeable smell, can be purchased at the like, if not a less price, than that which is paid for the sized material. Why then use this size? Without it the durability of the cloth is greater, and the wearing of it gives more comfort. The unstiffened corduroy is, in its pure state, of the nature of a velvet, being soft to the touch; but this material, when sized, becomes hardened, and this hardening process is simply adopted for purposes of deception. In a former issue, we gave particulars of the weaving and cutting of velvets and fustians, also specimens in the cloth, which showed a marked contrast to the sized fabric as generally made, much to the disadvantage of the latter. Mr. Madeley is now producing velveteens in varied colours and of brilliant finish for ladies' dresses and mantlings, and also the "Electric" velveteen, coloured by a peculiar process, spotted something similar to certain varieties of birds' eggs. This cloth caused quite a sensation at the Manchester Exhibition. He is also making a variety of ribbed "Beaver" cloths, registered as the "Travisian." The cloths are made in different qualities. We cannot speak too highly of the energy shown by Mr. Madeley in so sturdily fighting against the prejudices of those who have insisted upon buying and selling sized goods, and in having the courage to persevere against great odds, which has led to a successful issue.

### Aniline Black.

The amido compounds of the aromatic series furnish by oxidation a class of colours which, on account of their insolubility in ordinary solvents, can only find application when they can be produced by oxidation directly upon the fibre. One of these colours is the aniline black, which occupies such an important position. In spite of many attempts, the composition of aniline black has not yet been expressed by a symbol. Aniline black is an oxidation product. The oxidizing agents used in its production are chromic acid (potassium bichromate and sulphuric acid) and potassium permanganate; but the salts of those metals occurring in several states of oxidation are used, in connection with chlorate of potash, to the best advantage. These act as oxygen carriers between the aniline and the chlorate, and are themselves reduced by the aniline, and oxidized again by the chlorate. While chlorate of potash will hardly oxidize aniline alone, in the presence of a very small quantity of a copper compound the oxidation takes place with great rapidity. Also, iron, chromium, and osmium salts can be used, but without any great advantage over copper salts. Vanadium salts act in the most powerful manner as oxidizing agents, and this has proved of very great importance in the production of aniline blacks. Upon this oxidation principle depends the various methods for the production of the black upon the fibre. Lightfoot, in 1863, brought out the original method, which consisted in the production of the black by printing aniline with muriatic acid, copper chloride, and chlorate of potash, on the goods. Lightfoot replaced the chloride by the sulphate of copper, and the receipt, in its original form, is still in use to-day. With copper sulphide, instead of aniline chloride, pure aniline oil is used, and nitric and acetic acid mixed with the colour just before printing. Or the vanadium salts are used instead of copper salts. The colour contains aniline oil and chlorate of potash, and hydrochloric acid is added just before printing. Lightfoot observed the peculiar action of vanadium salts, but Gerard, in 1876, brought them into general use. One part of vanadium chloride is sufficient to change 1000 parts of aniline salts into the black at the ordinary temperature. The action of vanadium salts consists in their oxidation very readily by chlorate of potash into vanadic acid. Late experiments indicate an equal value for cerium sulphate, but it is not so cheap. In mixing the colour, unless aniline salts are used, the quality of the aniline oil to be mixed with the muriatic acid is of importance. The purest aniline should be used, free from orthotoluidine, which gives a blue tint, and free from paratoluidine, which gives a homely brown-black. Aniline black is distinguished for its extraordinary resistance to light, air, and moisture, but possesses the undesirable property of greening upon standing, and the goods turn green in store. But by washing with alkali, or even with soap, the colour comes back. It is thought that the greening is due to the presence of acid in the air, apparently from the burning of gas, which produces sulphurous acid; possibly it arises from the formation of acid by the action of the air and moisture upon the chlorine present to the extent of 4 to 5 per cent. in the black. In the use of acid oxidizing agents, as a solution of potassium bichromate acidulated with sulphuric acid, or an acid iron solution, a good means has been found for preventing the greening. An iron or chrome lake appears to be formed, as a considerable quantity of the metal is removed from the bath.—*Dr. Schüller before the Cologne Chemical Society.*

### Chemical Processes which take place when Dyeing Wool and Silk with Basic Tar Colours.

BY EDW. KNECHT.

The quantitative experiments which have been carried out by the author directly contradict the mechanical theory, according to which, when dyeing wool and silk with basic tar colours, the dye becomes simply absorbed in an unaltered form by the fibre (yarn). Wool has been boiled in a solution of 0.2 gm. of crystallised fuchsine in about 500 c.c.m. of water, until the colour has been completely removed from the solution. The fluid which remained re-acted neutrally, and contained ammonia. The quantity of hydrochloric acid originally contained in the fuchsine used amounted to 0.01630 gm., while the hydrochloric acid which remained behind in the solution amounted to 0.01622 gm. In a similar manner, a treatment was made with 0.2 gm. crystallised chrysoidine. The quantity of hydrochloric acid contained in the chrysoidine was 0.02446 gm., while, after removing the colour, 0.02476 gm. was found in the solution. A similar result was arrived at when using crystal violet, as also when dyeing silk with fuchsine and crystal violet. In the first place, these experiments prove that the dyeing of animal fibres with basic colouring matter does not depend upon a simple mechanical absorption, but upon a chemical transformation. This view is further supported by the fact that the fluid remained neutral (the salt acid had become united with the

ammonia and, probably, also with other basic bodies which are found during the partial decomposition) and that wool can be dyed an intense fuchsine red in the colourless watery rosaniline solution without the presence of acid at all. The question as to the nature of the combinations which become formed upon the fibre when dyeing with basic colouring matter must, for the time being, remain unanswered. It would be possible for these colouring matters, during the dyeing process, to become united with the carboxyl groups contained in the keratine or in the fibroine, forming an insoluble lake, or at least one difficult to dissolve, while, when dyeing with acid colouring matter, the dye acid becomes united with the amido group of the keratine or fibroine, and in this manner forms another kind of coloured lac.—*Chem. Soc. of Berlin.*

### On the use of Fluorochrome in Dyeing Wool.

BY H. LANGE.

The fluorochrome manufactured by the firm of Rudolph, Koepp and Co., in Austria, can, in many instances, be advantageously used in the place of acetate or nitrate of chrome for steam dyeing. According to experiments made by the author, this salt offers great advantages also in dyeing wool in the place of chromate of potash. The colours obtained by the use of fluorochrome are very bright and rich. The wool which has been impregnated with it obtains a lightish green appearance, owing to the direct precipitation of the chrome oxide upon the fibres, while, with the chromate of potash, the wool becomes yellow to greenish, in accordance with the duration of the boiling. If it becomes green, then most decidedly an oxidation of the fibres has taken place, simultaneously with a reduction of the chromic acid to chrome oxide, from which it is explained why the wool invariably becomes somewhat rougher and harder under this treatment. The quantity of the dye fixed appears, when using fluorochrome, to stand in direct proportion to the strength of the bath employed, which is not always the case when chromate of potash is used. Woollen yarn, which has been saturated for a lengthened period in fluorochrome, does not show the least tendency to felting, remaining very soft, so that, on the whole, no unfavourable action can be ascribed to this salt upon woollen yarns and colours. The saturated wool becomes easily soaked in the colour bath, and the colour baths are well spent. For instance, cloths are more regularly and perfectly dyed through with alizarine blue than by a boiling with chromate of potash. As copper becomes strongly attacked by fluorochrome, the boiling must consequently be effected in wooden vessels. Again, fluorochrome can, in many cases, be used with advantage where chromate of potash is not available, on account of its oxidising tendencies. For instance, where it has hitherto been impossible to colour wool previously dyed with indigo with a chromate of potash boiling without any sensible loss of indigo, this process can be easily carried through with fluorochrome without in any way injuring the indigo ground. Consequently, fluorochrome should be in favour, more especially in those cases where a beautiful and pure colour is desired, as also in those instances where the goods are dyed through with difficulty, forming a successful substitute for chromate of potash.—*Leipzig Journal of Textile Industries.*

### Benzidine Colours.

No group of artificial colours has increased in numbers during the last two years as rapidly as the azo colours capable of direct union with cotton, and, unfortunately, named the benzidine colours. Their introduction has caused a revolution in certain directions in cotton printing and dyeing. Numerous shades which were once obtained in a roundabout way can, to-day, be easily produced by the members of the group. The shades which they yield are beautiful and bright, but are not as fast to light as might be desired. The factory of F. Boyer and Co., in Elberfeld, has made a speciality of these colours, and has furnished not fewer than 20 colours to the trade, which are partly homogeneous products and partly mixtures. We have now various yellows, reds, violets, and blues, which upon mixing furnish a variety of good intermediate shades. Lately, another new representative of this class of colours has made its appearance, the benzo-brown. This colour gives on cotton a beautiful, brilliant, reddish brown which is fast to soap and dilute acids. Perhaps, it can be used for buff, in which case it will be largely employed.—*Chemiker-Zeitung.*

## The New American Tariff.

The new American tariff has passed the House of Representatives, amidst every demonstration of enthusiasm on the part of the Democratic party, and has been introduced into the Senate, by which it has been referred to the Finance Committee. The future progress of the bill is being watched with considerable interest by traders in this country. Appended are some particulars of the leading provisions of the bill. Section 3 contains a provision of great importance to the Bradford trade. It provides for the admission, when imported, "free of duty," to the following:—All wools, hair of the Alpaca, goat and other like animals. Wools on the skin. Woollen rags, shoddy, mungo, waste, and flocks. The section also provides that the duties to be levied on the following articles shall be revised and placed at the figures named:—Woollen and worsted cloths, shawls, and all manufactures of wool of every description, made wholly or in part of wool or worsted, not specially enumerated or provided for, 40 per cent. *ad valorem*. Flannels, blankets, knit goods, woollen and worsted yarns, and all woollen, worsted, alpaca, &c., manufactures of every description, 40 per cent. *ad valorem*. Bunting, 40 per cent. *ad valorem*. Women's and children's dress goods, coat linings, Italian cloths and goods of like description, composed in part of wool, worsted, the hair of the alpaca, goat, or other animals, 40 per cent. *ad valorem*. Ready-made clothing and wearing apparel of every description not specially provided for, balmoral skirts, &c., composed wholly or in part of wool, worsted, alpaca, &c., 45 per cent. *ad valorem*. Trimmings, cords, braids, &c., containing wool, worsted, &c., 50 per cent. *ad valorem*. All carpets and carpetings, druggets, bookings, mats, rugs, &c., of wool, flax, cotton, hemp, jute, 30 per cent. *ad valorem*. Cotton thread, yarn, warps, or warp yarn, whether single or twisted, and whether on beams, in bundles, skeins, or cops, or in any other forms, valued at not exceeding 40 cents per lb., 35 per cent. *ad valorem*; over 40 cents per lb., 40 per cent. *ad valorem*. Spool thread of cotton, 40 per cent. *ad valorem*.

## Tariff Changes and Customs Regulations.

**RUSSIA.**—Embroidery canvas of cotton, specially prepared.—Section 213. Duty, 45 cop. (1s. 5d. about) gold per Russian pound. pound = 36 lbs. avoirdupois.

**GERMANY.**—*Modifications in Tariff Rates.*—By a decision of the German Federal Council, the allowances for tare on the undermentioned articles are to be as follows:—Cotton yarn, single, raw.—Tariff category 2c 1. In boxes. An allowance for tare of 15 per cent. instead of 17 per cent. as formerly. Cotton yarn, with three or more threads, single or double twist, raw, bleached, dyed.—Tariff category 2c 4. In boxes of soft wood. Allowance for tare of 16 per cent. instead of 18 per cent. as formerly.

**FRANCE.**—*Allowance for Shrinking on Importation of Bleached Cotton Twists.*—A despatch, dated the 23rd June last, has been received from Lord Lytton, Her Majesty's Ambassador at Paris, enclosing copy of a report from Mr. J. A. Crowe, Commercial Attaché for Europe. With Mr. Crowe's report were transmitted copies of an extract from the *Moniteur Officiel du Commerce* containing the substance of a Custom house circular extending to bleached cotton twists in hanks the privileges hitherto confined to dyed yarns in hanks. The effect of this will be to concede an allowance (*Tolerance*) of 5 per cent. instead of 2 per cent. as hitherto for bleached twists imported in hanks.

**SWITZERLAND.**—The following decisions affecting the classification of articles in the Swiss Customs Tariff were given by the Swiss Customs authorities during the month of May last:—Bath towels, &c., of cotton with woven fringes, or even knitted: without embroidery; cotton tissues cut for shirts, &c., without embroidery.—Category 286. Duty, 35 frs. per quintal. Bath towels, &c., of cotton, with woven fringes, or even knitted: with needle-work.—Category 289. Duty, 60 frs. per quintal. Carpets of jute combined with animal matters (animal hair, &c.), common, without fringes or embroidery, or simply with a rough hemming at the borders.—Category 341. Duty, 12 frs. per quintal. Carpets of jute combined with animal matters, other than common, such as carpets cut in imitation of velvet, shayed, or with pile, carpets with fringes or needle-work, &c.—Category 342. Duty, 30 frs. per quintal.

Note.—Quintal = 220 $\frac{1}{4}$  lbs. avoirdupois. Franc = 9 $\frac{1}{2}$ d.

**ITALY.**—*Exemption from Customs Duty of Machinery for New Textile Factories.*—In a despatch, dated the 26th June last, Mr. Kennedy encloses text of a bill, with preamble, recently distributed to the Italian Chamber of Deputies, recommending the exemption from customs duties of machinery required for the establishment of new textile factories. The text of the bill is as follows:—Art. 1. The king's Government has a right to permit the importation free of duty of machinery for weaving and accessory operations necessary for the establishment of factories for the manufacture of tissues, of machine-made embroideries and similar articles, which hitherto have not been produced in Italy. The concession can also be extended to factories which turn out classes of tissues not new to Italy, provided that a favourable opinion be obtained from the Superior Council of Industry and Commerce. Art. 2. The concession

will be made for each individual factory by a decree of the Minister of Finance and Commerce. Art. 3. A regulation, to be approved by a Royal decree, will establish the necessary guarantees and all other rules for the execution of the present law. Mr. Kennedy, with reference to the above, says—"The report of the Committee of the Chamber states that this bill is proposed to meet the wishes of foreigners and Italians who wish to establish in Italy textile industries hitherto not produced in the country. Such products require special and complicated machinery only to be obtained abroad. The establishment in Italy of new industries will be a national gain, and Italian machine makers will find employment in mending the new machinery, and in learning to produce it. I am informed that it is proposed to establish a factory near Milan for the production of Nottingham lace goods. No opposition is anticipated to the above bill, which removes the duty of 10 lire per quintal upon weaving looms."

The following alterations are introduced into the Italian Customs Tariff, approved by the law of 14th July, 1887:—The duty on cotton yarns, grey singles, which measure from 20,000 to 30,000 metres to each  $\frac{1}{2}$  kilog. of weight, is increased to 32 lire, and that on the same yarns that measure from 30,000 to 40,000 metres to every  $\frac{1}{2}$  kilog. of weight, is increased to 40 lire the quintal.—*Board of Trade Journal.*

Note.—1 lire = 9 $\frac{1}{2}$ d. 1 kilog. = 1 lb. 1 quintal = 100 lbs. avoirdupois. Metre = 39 $\frac{3}{8}$  inches.

## Laws Concerning Manufactures.

A bill has been introduced by Mr. Howell, Sir Henry James, Mr. Mundella, and others, for repealing certain statutes of the last century, and the beginning of the present one, which have ceased to be put in force, or have, they think, become unnecessary, or are inconsistent with modern legislation. The statutes in question deal with the regulation of the relations between employers and employed in various manufactures. They are classified in four groups. In the first group, which relates to frauds by workmen, the object was to impose summary penalties on workmen convicted of embezzling or purloining materials given out to them for the purpose of being worked up in the woollen, linen, fastian, cotton, iron, and other manufactures. The Acts empower one or two justices to order persons convicted to forfeit double the value of the damage sustained by their employers, or to pay a pecuniary penalty, and, failing payment, to be whipped (a punishment since repealed) and kept to hard labour for some time. Similar penalties might also be imposed on persons convicted of buying or receiving materials from the workmen, and search warrants might be granted by the justices. Some of the Acts contain a provision that all materials given out to be worked up shall be delivered with a declaration of their true weight. Some enactments apply to the misappropriation of tools and materials, and another to journeyman dyers dyeing for their own profit. The second group of statutes, which relates to the payment of wages, requires clothiers and other manufacturers to pay the full wages agreed on, and to pay them in coin and not by way of truck, and also empowers two justices to settle disputes as to wages between employer and employed. In the third group, which relates to theft, one Act enables any justice to issue a search warrant for woollen goods suspected of having been stolen. Any person who fails to give a satisfactory account of woollen goods found in his possession is liable to be convicted of theft, and, for a first offence, to pay treble value, for a second one to be imprisoned for six months, and for a third to be transported for seven years. Another Act makes persons convicted of stealing linen, &c., from a bleaching ground to the value of 10s., or receiving it knowing it to be stolen, punishable by transportation for life, or by imprisonment for a term not exceeding seven years. The fourth group of statutes contains minute directions for regulating the woollen manufactures in particular localities.

## Commercial Failures.

According to *Kemp's Mercantile Gazette*, the number of failures in England and Wales gazetted during the four weeks ending Saturday, July 28th, was 388. The number in the corresponding four weeks of last year was 387, showing an increase of 1, being a net increase in 1888, to date, of 41. In addition to these gazetted failures, there were 311 Deeds of Arrangement filed at the Bills of Sale Office during the same four weeks, making a total in 1888, to date, of 2,006. The number of Bills of Sale published in England and Wales for the four weeks ending Saturday, July 28th, was 901. The number in the corresponding four weeks of last year was 1,053, showing a decrease of 157, being a net decrease in 1888, to date, of 458. The number published in Ireland for the same four weeks was 43. The number in the corresponding four weeks of last year was 60, showing a decrease of 17, being a net decrease in 1888, to date, of 115.



## ORIGINAL DESIGNS.

On our first plate is a design for a Table Cover. Space would not permit of our giving this the proper size. It should, however, be produced in 6½ in. body, and 6½ in. border. In three or four colours it would make an effective pattern for Tapestry of a fine quality. This has been drawn by Mr. R. T. Lord, 97, Park Road, Bradford.

Our second plate shows a design for a Silk Handkerchief, it has been drawn by Mr. C. W. Sandiforth, 103, Racecommon Road, Barnsley.

The third plate presents a design for a Lace Curtain, drawn by Mr. R. T. Lord.



## MONTHLY TRADE REPORTS.

**Wool.**—There has been an improved feeling manifested in the wool industry generally. The firm rates prevalent at the recent London sales have had an influence upon the local markets, and prices have been quatably higher for most classes of wools. English wools in the country are now held firmly for higher prices, there being no disposition to sell unless at an advance. Buying has only been for actual consumption, although, in a few cases, large transactions have taken place. The feeling generally is cheerful. The yarn trade has also improved, orders having recently come more freely from the Continent and other countries, whilst the home branch has been in a fairly satisfactory condition. Prices have been firmly maintained, and the tendency at the close of the month was upwards. The piece trade has kept fairly employed, although new orders are, for many varieties of goods, in small quantities.

**Cotton.**—The sales of raw material has been about an average. The yarn trade has not been quite so satisfactory as during the preceding months of the year, the demand for the Continent and other foreign countries, with some exceptions, having fallen off. The home branches have also been quieter. This has had its effect upon pieces and they have, consequently, shown a weakening tendency. In the cloth branch, with the exception of India, the demand for abroad has been below the average, and there has been an accumulation of stocks. The home trade has also been quiet, the recent unsettled weather having had a bad effect on sales. There has been an almost entire absence of speculation in all branches. Notwithstanding this, prices have not shown much variation.

**Woollen.**—Owing principally to the unsettled state of the weather during the past few weeks, the business transacted by travellers in different parts of the United Kingdom has been below the average, and this fact is having a marked effect upon manufacturers. Orders have not been given out so freely as usual for the home trade, although mills are generally running full time on old orders. The shipping branches have been fairly busy, the demand for the Continent especially having improved, whilst for America and Australia some good orders have been booked. As we have had to report for some time past, the finer qualities of worsteds in good designs and colourings still take the lead, and plain goods have been in less demand. Tweeds of low qualities have fallen off a little, the weather having been against sales, but those of good qualities have sold fairly well. Manufacturers are in hopes of an improvement should more genial weather make its appearance.

**Lace.**—The aspect of this branch of trade has been decidedly unfavourable, the month having been much quieter than the corresponding ones for some years past. With the exception of a few special makes of goods, the demand both for home and abroad has been very flat. Goods of nearly all kinds

are to be had in abundance, although production has been much curtailed recently. Adverse fashion—other goods having largely superseded lace—and the unseasonable weather, in addition to foreign competition, are having a very bad effect upon the trade, prices showing such variation that some goods are scarcely quotable.

**Linen.**—This branch of industry has shown but slight variation since last month, and if any change has taken place there has been a slight falling off in demand for the home trade, whilst, for shipping account, orders have come in rather slowly. In flax, there is little new to note, stocks are generally light, and this has had a tendency to keep prices firm. In jute yarns, only a moderate business has been done, but a hopeful feeling exists; in jute goods, business at the beginning of the month was rather quiet, but, towards the close, an improvement was experienced with firm prices.

## Hints from Mexico.

A French merchant in Mexico says that the demand for woollen tissues is not altogether subject to the prevailing taste of the consumers, but depends to a great extent on the changes that take place in the Customs tariff. At equal prices, however, the Mexican consumers prefer thick, heavy stuffs to light materials, notwithstanding the tropical climate. The Verviers manufacturers have been gaining ground of late years, and at present three-fourths of the kerseymeres imported are manufactured in Belgium. The so-called "nouveau" are supplied by France and Great Britain. Zanillas manufactured in Roubaix are largely imported for ladies' dresses, and imitations with a cotton twist are supplied by Germany. Black and coloured alpaca is imported from Great Britain and Germany in widths of 18 to 21 inches. Imitation Brussels carpets are supplied by Great Britain, the width being generally 27 inches, and the price varying according to quality from 1½ to 4 piastres per vara.

### A CHANCE FOR BRITISH MANUFACTURERS.

Black merino meets with a constant and increasing demand, the bulk being supplied by France, and a small portion by British and German houses. The coloured merinos are imported in three widths, namely, 0.70 to 0.80, and 0.84 of a metre. As regards linen tissues, a large quantity of damask table linen, known in the country as alemanisco, is imported from Great Britain. The Italians endeavoured to obtain a share of this trade, but their products did not suit the tastes of the Mexican consumers. Irish linen is imported in lengths of 25 yards, and 27 to 28 inches wide. Sailcloth also meets with a considerable demand, and arrives from Great Britain in widths of 28 to 29 inches. The linen handkerchiefs imported into Mexico come from Great Britain, France, or Belgium, but the largest share of this trade, which is considerable, is absorbed by the British exporters. The British goods of this description are put up in boxes containing one dozen, while the French come in packets containing three dozens. Linen handkerchiefs are sold in Mexico at 2 to 14 piastres per dozen.



## ODDS AND ENDS.

Messrs. Eckersley and Co., Limited, Wigan, are erecting a new mill, which, it is said, will be the largest ring spinning factory in the country, as it is designed to contain 60,000 ring spindles (spinning). The order for the whole of the spinning, drawing, slubbing, intermediate and roving frames has been placed with the well-known firm of Mr. Samuel Brooks, Union Ironworks, West Gorton, and Junction Ironworks, Manchester, who also supplied the same firm, a few years ago, with 40,000 ring spindles for a mill which they had then erected. We are told that the frames being made for the new factory will contain all the latest improvements which have resulted from the added experience of this system of ring spinning. When Mr. Brooks has completed the present order, he will have supplied Messrs. Eckersley with nearly 150,000 on this system during the past seven years.

Parcels not exceeding 7 lbs. in weight are received at any post office in the United Kingdom for transmission to the Argentine Republic and Chili, via Germany. Parcels for the Argentine and Chili will be included in the mails for Hamburg, despatched from London every Wednesday, Thursday, and Saturday morning. From Hamburg, parcel mails are despatched to the Argentine every Thursday, and to Chili every alternate Monday, commencing the 25th June. Rates of postage:—For a parcel not exceeding 3 lbs., to the Argentine Republic, 4s. 7d.; to Chili, 4s. Exceeding 3 lbs. but not exceeding 7 lbs., to the Argentine Republic, 5s. 1d.; to Chili, 4s. 6d. The parcel post service in the Argentine is confined to the towns of Buenos Ayres, Cordova, and Rosario. No parcel can be accepted for transmission which does not bear the name of one of those towns as part of the address.

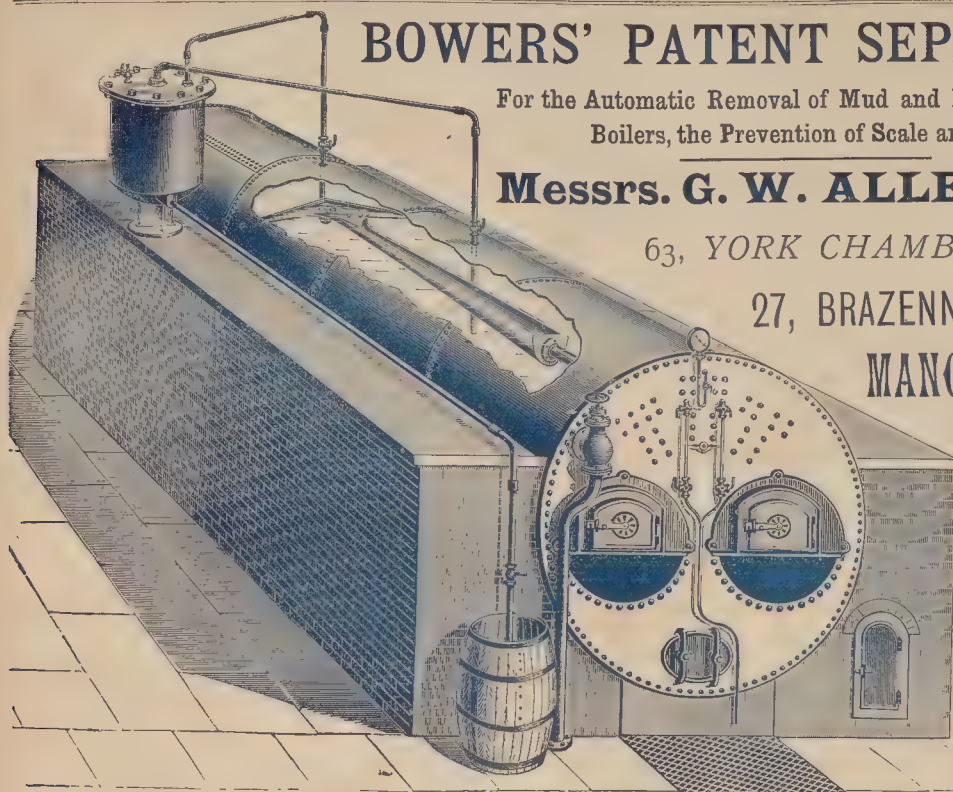
# BOWERS' PATENT SEPARATOR

For the Automatic Removal of Mud and Deposit in Steam Boilers, the Prevention of Scale and Priming.

**Messrs. G. W. ALLEN & CO.,**

63, YORK CHAMBERS,

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## E. V. COOKE & CO.,

Formerly with the late firm of Wm. HIGGINS & SONS,

COTTON AND SILK MACHINISTS, LOOM MAKERS,

ENGINEERS, IRON AND BRASS FOUNDERS, &c.,

Windsor St. Iron Works, SALFORD, Manchester.

### SPECIALITIES.

HIGGINS' Patent Drawing Frames.

HIGGINS' Patent Long or Short Collar Slubbing Frames.

"	"	"	"	Intermediate	"
"	"	"	"	Roving	"
"	"	"	"	Merino	"
"	"	"	"	Silk	"
"	"	"	"	Silk Dandy	"

E. V. COOKE'S Patent Improved Smallware Looms of all kinds.

### SPECIALITIES.

HIGGINS' Patent Ring Spinning Frames.

"	"	"	Doubling	"
"	"	"	Flyer Throstle	"
"	"	"	Doubling	"

E. V. COOKE'S Patent Draw Frames for Silk.

"	"	Improved Cone Dandy Rovers for Silk.
"	"	Spinning & Doubling Frames for Silk.

Accessories for every kind of Machine made to sample or sketch.

August 12th, 1888.

THE JOURNAL OF FABRICS AND TEXTILE INDUSTRIES.

# J. H. RILEY & CO., BURY, near Manchester.

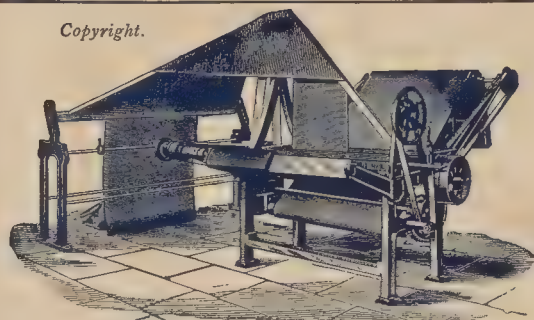
## Specialities.

**RILEY'S PATENT FULL WIDTH  
BURR EXTRACTING OR CARBONISING MACHINE**  
for Dyed and Undyed Woollen Goods.

**WET FINISHING MACHINE**  
for Bradford Dress Goods.

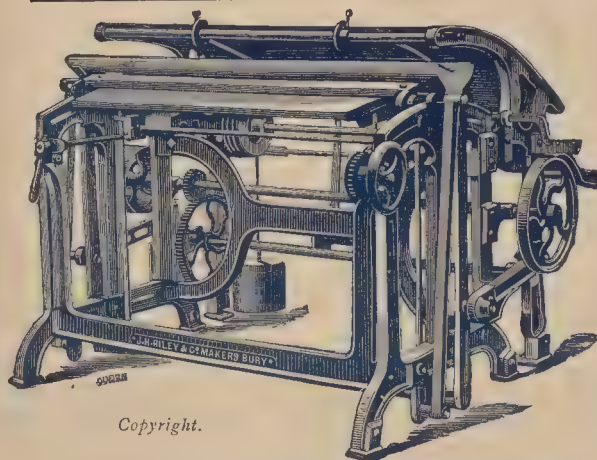
**CALENDERS** for Satteens, Italians, and every class of Textile Fabrics.

Copyright.



## ELDER & RILEY'S PATENT RIGGING MACHINE

for Stuffs and Woollen Cloths, as supplied to Her Majesty's Clothing  
Depôt, Pimlico, and to the Indian Government. References to a  
large number of machines at work.



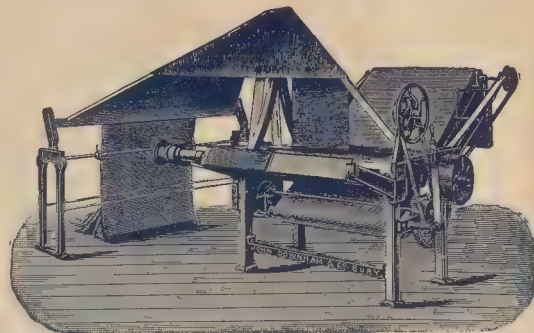
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## RILEY'S PATENT GRIP CUTTLING MACHINE

For Single and Doubled Woollens, the best and strongest Machine made.  
We have some scores of these machines at work.

**J. H. RILEY & CO.,  
BURY, NEAR MANCHESTER.**

# JOHN DOWNHAM & Co. BURY, near Manchester.



**ELDER'S RIGGING MACHINE,**  
WITH DOWNHAM & CO.'S PATENTED IMPROVEMENTS,  
For Doubling all kinds of Woollen and Worsted Goods lengthwise.

**IMPROVED CUTTLING MACHINES**  
For Folding Single and Double Woollens and Worsted.

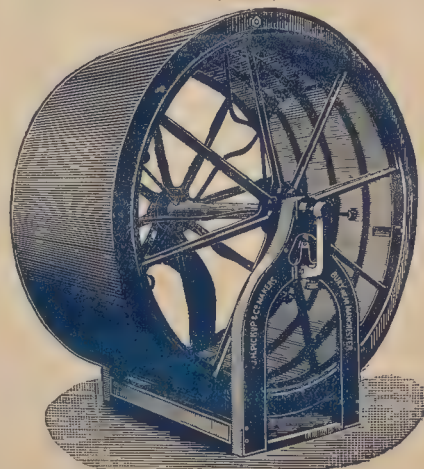
**STEAM DRYING MACHINES,**  
WITH TIN AND COPPER CYLINDERS,

Calenders, Beetles, Dye Becks, Dye Jigs, &c.  
Prices and Drawings on application.

**J. H. PICKUP & CO.,**  
(Successors to JAMES ANKERS)

**TIN-PLATE WORKERS, COPPERSMITHS, &C.,**

**Britannia Works, BURY, near Manchester,**  
Makers of every description of Tin, Iron, Zinc, Brass & Copper Goods,  
For Machinists, Cotton, Woollen and other Mills.



Tin Rollers for  
Ring Frames,  
Mules, Throstles,  
Winding and  
Warping Frames

We have made a  
speciality in Tin  
Rollers, knowing  
the importance of  
Machinists and  
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ing a good and  
true Roller to run  
the speeds that  
are now required.  
Our Rollers are  
made from the best  
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**LARGE STEAM DRYING CYLINDERS,**  
Any diameter up to 12-feet, and any length, either in Tin or Copper.

**SINGLE CASED OR CAVITY CYLINDERS** made on the most approved principle.  
ESTIMATES ON APPLICATION. REPAIRS PROMPTLY ATTENDED TO.





12TH AUGUST, 1898.

DESIGNED BY C. W. SANDIFORTH.



SILK HANDKERCHIEF.



## FASHIONABLE \* DESIGNS.

## Woollen Suitings.

No. 540.

Warp:—1 end Black, 20 skeins.  
1 " Olive "

Weft:—2 picks Black, 20 skeins.



Design.

2 " Claret, "  
1 pick Blue 80's, twisted to Crimson 80's.

2,804 ends in warp; 36 ends per inch; 32 picks per inch;  
8 healds; 18's slay; 2 ends in a reed; 64 inches wide in the  
loom; 56 inches wide when finished. Weight 18 ozs. Straight  
draft.

No. 541.

Warp:—4 ends Black, 11 skeins.



2 " Olive 20's, twisted to Black 20's.

4 " Black, 11 skeins.

1 end Red 20's, twisted to Black 20's.

3 ends Olive " "

4 " Black, 11 skeins.

3 " Olive 20's, twisted to Black 20's.

5 " Black, 11 skeins.

1 end Red 20's, twisted to Black 20's.

2 ends Olive " "

4 " Black, 11 skeins.

4 " Olive 20's, twisted to Black 20's.

1 end Red " " "

Straight draft.

Weft:—2 picks Olive and Black twist as warp.

3 " Black.

3 " Olive and Black twist as warp.

3 " Black.

2 " Olive and Black twist as warp.

16 " Black.

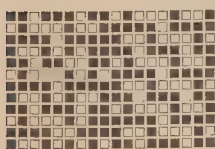
3 " Olive and Black twist as warp.

16 " Black.

1,792 ends in warp; 28 ends per inch; 28 picks per inch;  
8 healds; 7's slay; 4 ends in a reed; 64 inches wide in the loom;  
56 inches wide when finished. Weight about 22 ozs.

## Trouserings.

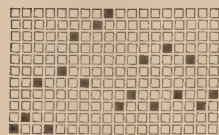
No. 542.



Design.



Plan.



Draft.

Lift Black.

2 ends Black worsted 2/20.

1 end " cotton 2/40.

1 " " worsted 2/40.

1 " " cotton 2/40.

1 " " worsted 2/40.

1 " " cotton 2/40.

2 ends " worsted 2/20.

1 end Red worsted 2/30.

1 " Cream worsted 2/30.

1 " White cotton 2/40.

1 " Cream worsted 2/40.

1 " Red cotton 2/40.

1 " Cream worsted 2/40.

1 " White cotton 2/40.

1 " Cream worsted 2/30.

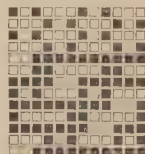
1 " Red worsted 2/30.

4,586 ends in warp; 72 ends per inch; 32's reed, 3 ends in  
a reed.

3 reeds, 3 ends in a reed; 1 reed missed; 3 reeds, 3 ends  
in a reed; 1 reed missed.

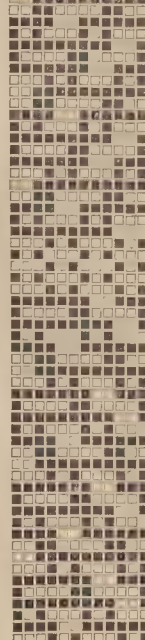
56 picks per inch; weft, Black woollen 12 skeins.

Weight 24 ozs. finished; 64 inches wide in loom; 56  
inches wide when finished.

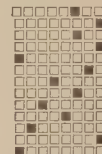


No. 543.

Lift White.



Design.



Draft.



Plan.

1 end Red worsted.  
30 ends Brown worsted.  
1 end Blue worsted.  
1 " Blue silk.  
1 " White silk.  
1 " Red worsted.  
30 ends Slate worsted.  
1 end Red worsted.  
1 " Blue silk.  
1 " White silk.

8,064 ends, 2/40's worsted warp.  
504 " , 36/2 silk worsted warp.

126 ends worsted in one inch. Silk extra 2 ends to 32 of worsted.

31½ reed, 4 ends in a reed; 64 inches wide in loom;  
56 inches wide when finished.

60 picks per inch, 2/40's worsted face.  
30 " " , 20 skeins woollen back.

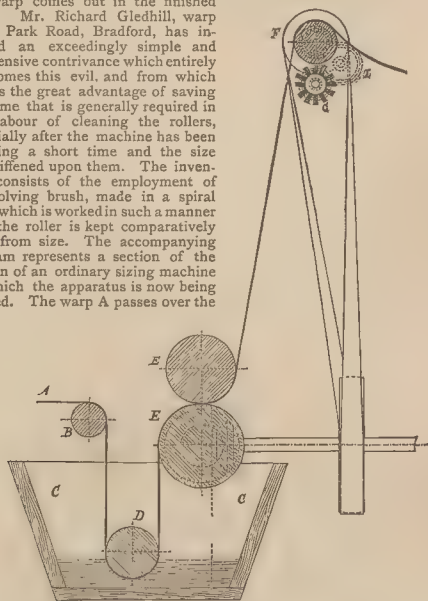
22 ozs. finished.

## MACHINERY, &C.

### Improved Machine for Sizing Worsted and other Warps.

In the sizing of warps, either of worsted or other fibres, there are repeated complaints made of the uneven nature of the size upon the yarn, and of the threads adhering to each other, these faults, amongst others, being the result, in many instances, of the accumulation of size upon the roller over which the warp passes towards the drying chamber, after going through the sizing process. The warp in its progress over the roller gradually deposits the size upon it, with the consequence that a part of it is again taken up by the warp in an uneven state, causing the threads to adhere to each other, and thus numerous difficulties occur before the warp comes out in the finished piece.

Mr. Richard Gledhill, warp sizer, Park Road, Bradford, has invented an exceedingly simple and inexpensive contrivance which entirely overcomes this evil, and from which results the great advantage of saving the time that is generally required in the labour of cleaning the rollers, especially after the machine has been standing a short time and the size has stiffened upon them. The invention consists of the employment of a revolving brush, made in a spiral form, which is worked in such a manner that the roller is kept comparatively clear from size. The accompanying diagram represents a section of the portion of an ordinary sizing machine to which the apparatus is now being applied. The warp A passes over the



carrying roller B, and forward into the sizing trough C, and then under the roller D, and afterwards through the squeezing rollers EE, and from thence over the carrying roller F, and on to the drying chamber. The evil which this invention counteracts arises at the roller F, through, as before stated, the wet sizing from the warp adhering to it. To prevent this, the revolving brush G, or a similar contrivance, is made to act upon the roller F in such a manner that it is continually kept clear and free from size. The roller F is driven by means of a belt from the shaft H, which is connected with the headstock of the machine, and which also drives the squeezing rollers EE, the motion being given to the revolving brush G by the intermediate wheel I. The apparatus can be easily and economically fixed, and will, undoubtedly, be a great saving in many respects. Mr. Gledhill will give further particulars on application, and those interested can see the invention in operation at his works in Bradford.

### Loom Woven Mosquito Nets.

Mosquito nets are mostly manufactured on lace machinery, but Mr. J. Eccles, of Preston, has recently patented a method of weaving them in a loom, by means of leno harness or healds, in such a manner that they form a good imitation of the openwork net in lace, and the material is so interlocked in the weaving that the various threads are comparatively fast, and there is little liability of the weft threads moving from the lines in which they are woven across the piece of fabric when the operation is completed. When such a ground is woven as plain net all over the piece, it forms a substitute for the plain mosquito netting manufactured on the lace machine, and has the advantage of being strong in texture, and thus there is little liability of breakage of the meshes. At the same time, by means of the

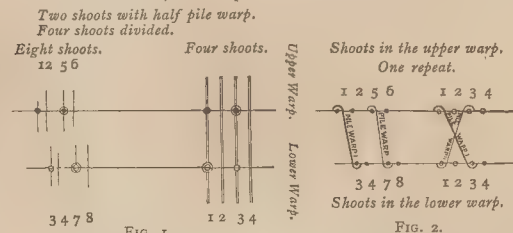
jacquard or substitutes therefor, patterns of various designs may be made by weaving spots, figures, cross-overs, or stripes, or combinations thereof, in plain cloth, twill, or other weaving, which is so interspersed with the ground-work or open-work netting above named as to be still suitable for mosquito netting. From the illustration of the material on a magnified scale, the method of weaving, and the actuation of the separate warp threads and their interlocking with the weft to form the netting effect, may be gleaned by those engaged in leno weaving. The threads of warp to be separately actuated to form one strand of the plain netting or ground referred to are three, which may be repeated in threes to any width of reed space desired. One of each of these three warp threads, A, is drawn through a dupe heald or harness, and the other two, B and C, are drawn through plain healds or harness, and the mode of actuation is as follows:—The



threads A and C are lifted, and the threads BB are left down or depressed, as the case may be, by means of the ordinary jacquard or other actuating mechanism of the healds or harness, to form a shed for the passage of the weft. At the next pick or motion, the threads A and C are depressed, and the threads BB are lifted to form a second shed for the passage of the shuttle. At the third pick, A and C are again raised, and BB depressed. At the fourth pick, the thread A is lenoed or crossed over the threads B and C, and the like tabby weaving is continued with the threads A, B, and C, in the crossed position, for three more picks, when the thread A is passed back again to the original position, and the cycle of operations again commences, as will be seen from the drawings, or the whole of the movements might be reversed.

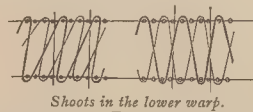
### Double Pile Fabrics.

An invention has been patented for the manufacture of double pile fabrics in such a manner that, for securing the pile to the warp by means of the shoot, only a single binding is required in each repeat of each fabric, whereas, in such manufactures heretofore, the weaving is so arranged as to bind the pile twice in each repeat. The attainment of this object depends upon the motion of the pile warp in the system of weaving with four shoots. While on the one hand, with the present mode of manufacture, two shoots



out of the four bind the pile warp with the ground warp of each fabric, as indicated diagrammatically at Fig. 4 of the accompanying drawing, according to the invention, on the other hand, only one shoot out of the four effects the binding of the pile warp in each fabric, as indicated at Fig. 5. By this means, a less amount of pile warp is used for the binding than heretofore, the part from the point a to the point b, Fig. 4, being saved, and this important saving constitutes the essential feature of the invention. This saving amounts to about the same length as that of the single fabrics, so that with a length of, say, 40 yards of fabric, there is a saving of about 40 yards of pile warp. The double fabric can be produced either with a single shuttle thread for both warps, or with a single shuttle thread for each warp. As in the present mode of four-shoot weaving, the whole of the pile

Shoots in the upper warp.  
One repeat two and a half times.



Shoots in the lower warp.

FIG. 3.

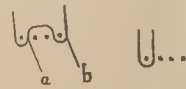


FIG. 4.

FIG. 5.

warp is not bound with the ground warp by one shoot of each set of four shoots ("repeat"), but only half thereof, for instance, with the first shoot and the other half with the third shoot. Thus, while 1 and 3 work with the

one half (pile No. I), and shoots 3 and 4 with the other half (pile No. II), only shoots 1 and 3 serve for binding the pile warp with the ground warp, the shoots 2 and 4 being merely woven in with the ground warp without binding the pile warp. The fabric is produced by the repetition of these operations, that is to say, by "repeats," each of which consists of:—

Binding shoot for one half of the pile warp (pile I).

Shoot in ground warp, without binding pile warp.

Binding shoot for the second half of the pile warp (pile II).

Shoot in ground warp, without binding pile warp.

The working of the pile warp for carrying out this mode of weaving is shown at Fig. 1 of the drawing, both for looms with a single shuttle for both ground warps (at the left hand side), and for looms with a shuttle for each ground warp (at the right hand side). With the looms having a single

② Descent and binding shoot for pile warp II in lower warp.

● Ascent and binding shoot for pile warp I in upper warp.

● Descent and binding shoot for pile warp I in lower warp.

● Ascent and binding shoot for pile warp II in upper warp.

Shoot with one shuttle for upper and lower warp.

Shoot with one shuttle each for upper and lower warp.

shuttle, it is necessary, as is well known, that shoots must be alternately thrown in the upper and the lower ground warps. In the present case, it has been assumed that two consecutive shoots are thrown, first, in the upper ground warp, and then in the lower ground warp, the first shoot of each being the binding shoot for the pile warp. When weaving with two shuttles, it is the most obvious to bind one half of the pile warp in the upper ground warp at the same time that the other half of the pile warp is bound in the lower ground warp, this being the arrangement assumed in Fig. 1. The arrangement of the harness and the sequence of the shoots for attaining the above object are however immaterial. Fig. 2 shows a side view of the fabric, from which it is seen that the pile warp binds half in two shoots, or the whole divided in four shoots in each fabric. Fig. 3 shows the fabric with 2½ repeats.

### A New Composition for the Preparation and Finishing of Cotton, Linen, and other Yarns and Cloths.

A material in the form of a paste has been patented by Mr. N. O. McIlhagga, of Belfast, for the preparation and finishing of cotton, linen, and other yarns and cloths. The composition is made up of 10 parts to any required quantity, of which 4 parts are palm oil; 2 parts are barilla soap; 1 part is lard oil; 1 part is ammonia; 2 parts are water. The features of novelty claimed for the composition are—(1st) Saving in use of more expensive finishing materials, and great economy in labour. (2nd) The composition entirely destroys chlorine or other gases or acids which have been lodged in the fibre of the material during the first processes of preparation for bleaching or finishing. (3rd) The composition imparts a high class and beautifully soft silk or satin finish to linen or cotton yarns or cloths, and will amalgamate readily with starch or other sizing materials.

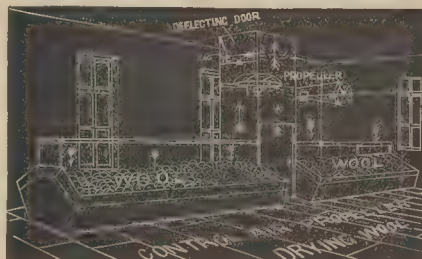
### The Control Air Propeller.

We have pleasure this month in bringing before the notice of our readers the "control air propeller," of which Messrs. Gass Brothers, Hesford Foundry, Bolton, are the makers, and which, although comparatively new on the market, seems to be receiving a very fair share of support, to judge by the numbers now running. It is well known that even a plain disc when revolving will throw air off radially, so that a propeller which takes advantage of this natural action must increase its delivery, as compared with one in which it is endeavoured to counteract this action by any of the numerous devices now employed, such as bending the blades over at the rim, enclosing

them in a tube, and so on. This action the makers take advantage of, the propeller, from its construction, allowing the air to escape radially when moving, the result being that a delivery of 17,000 cubic feet per H.P. per minute has been obtained. It is made of the best material, and very substantially put together; it can be readily placed in any position, either to exhaust from, or blow into, a room; it can be oiled while running, as both bearings are on one side of the propeller, and its simplicity enables it to be placed on the market at a most reasonable price. It has been conclusively proved that for drying purposes a rapid current of cool air will accomplish more, and give better results, than a hot room in which no air is moving; these propellers have been very successfully employed for this work, and for drying material, such as wool, cotton, rags, &c., they are admirably adapted, as they are sufficiently powerful to overcome any resistance which these conditions would cause. For stentering machines for removing the saturated air, they

have given excellent results. We have seen some rooms in which rag

breaking machines were at work—a blue dusty vapour rising which must be very injurious to the attendants—we are confident that a small sum spent in removing this will more than repay the owners in the better attention their workmen would be able to give to the machines, and for this purpose, we are informed that the control air propeller does everything that is required. The propeller is made with shutters for regulating and con-



trolling the supply of air on the inlet side (from which it takes its name), with self-closing back draught shutters, or combined with steam, electric, or water motor. Messrs. Gass Brothers are also makers of improved hot and cold air drying machines for wool, cotton, rags, &c.; they will be pleased to answer any enquiries made to them or their agents.

### Holden's Assisted Draught Furnace and Smoke Preventer.

In our last number, we gave particulars of Holden's "Assisted draught furnace" and smoke preventer. We were unable then to supply full illustrations of this important invention, but being now in a position to do so, we scarcely need apologise if, in making a further reference to this invention in our present number, we repeat some of the most important particulars already given concerning it. In order to fully understand the principles upon which the assisted draught furnace has been based, reference should be made to Figs. 1, 2, and 3. The 1st

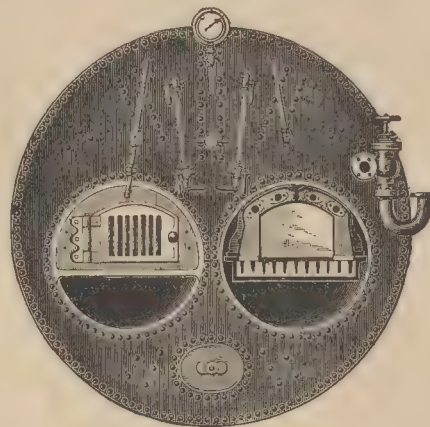


FIG. 1.

Fig. shows a front view, and the 2nd and 3rd Figs. sectional views, with the invention applied to each of them. From these views it will be noticed that the air enters at the mouth of the ashpit. The ashpit is extended slightly behind the bridge in order to form an inlet at the far end for the admission of the air through hollow fire-bars to a hollow deadplate. Rising from this deadplate are two pipes, one on each side the fire-door, at the termination of which are improved steam and air jets, controlled from outside in the usual manner. The air, having reached the deadplate, rises through the pipes above mentioned to a chamber over the fire-door, from whence it enters the furnace through short tubes, shown in Fig. 2. The steam jets may be actuated at will, and when brought into operation deliver the air to the furnace with great velocity, thus causing thorough combustion of the gases arising from the burning fuel. Where compressed air is available, it may be used in place of steam, with an equally good result. There are many advantages which are justly claimed for this furnace. These we fully entered into in the course

of the article above mentioned. They may be again briefly stated. The furnace is simple in construction, and no change is required in the boiler, neither does it need any skilled attendant to manage it, whilst less time and labour are required to keep the fires in order, and these may be cleaned out with greater ease and rapidity. The object of the furnace being to supply a current of heated air above the fuel, and a draught below the firebars, we may say that whether with or without the aid of the steam jets, the object is accomplished to a remarkable degree of perfection. The draught is greatly increased in the ashpit, thus causing perfect combustion of the fuel on the bars; a constant supply of heated air is distributed above the fires, resulting in immediate combustion of

the gases arising from the fuel. In developing the heating power of the coal, and, as a smoke preventative, the apparatus is most efficient. The varying states of the fires during light, heavy, or irregular, firing, are easily overcome, as the velocity of the draught may be increased or decreased accordingly. Waste heat from the firebars, as well as that which radiates through the front of the furnace, is utilized. Such are a few of the advantages of this assisted draught furnace and smoke preventer, which we do not hesitate to say accomplishes its aims to a remarkable degree. As we before stated, the first of these appliances was fitted up at

Messrs. E. Green and Son's Economiser Works, Wakefield. Messrs. Thomas Barnes and Sons, Mosesgate, Bolton, have had their No. 4 mill fitted complete with the furnaces; and the diagrams taken from Mosses's indicator, instead of showing a continued zig-zag as formerly, now shows a straight line from week to week, whilst there is a considerable reduction in the consumption of coal, and smoke is entirely

prevented. They have also been fitted to the whole of the boilers at Messrs. Peebles and Sons' paper mill, Whiteash, where we are informed they consume 240 tons of fuel under 3 boilers, per week, working night and day, commencing at 6 o'clock on Monday morning, ceasing at 6 o'clock on Saturday afternoon; this firm has also had them fitted to their boilers in the works at Rishton. The Globe Spinning Mill Co., at Church, near Accrington, have also adopted this furnace, as have also the proprietors of the *Manchester Courier*, as well as the firm of Messrs Wm. Whiteley, Westbourne Grove, London. These are a few who have already

adopted this assisted draught furnace. These firms have furnished results of their experience since the adoption of the apparatus, in each case most gratifying testimony being paid as to its practical value, which fully bears out all the inventor claims for it. The furnace is suitable for, and answers the purposes for which it is intended quite as well in marine as in land boilers. The experiment in this form was made on a vessel running from Newcastle to Spain and Italy. It was supplied with six furnaces, all burning the smoky North-country coal, and yet very little smoke was seen to come from the funnel during the whole voyage. The vessel, it is stated, not only made the outward and return run in a shorter time than usual, but at a less cost for fuel, and as the result was more than satisfactory, the owners of the vessel have ordered these furnaces for the whole of their other vessels. As far as we have heard, wherever the mechanism has been tried, it has proved an entire success. Messrs. George H. Holden and Co., the well-known makers of twisting, winding, and doubling machinery, of Carr Street, Blackfriars Street, Manchester, are makers of the furnace, and full particulars of it may be had on applying to them.

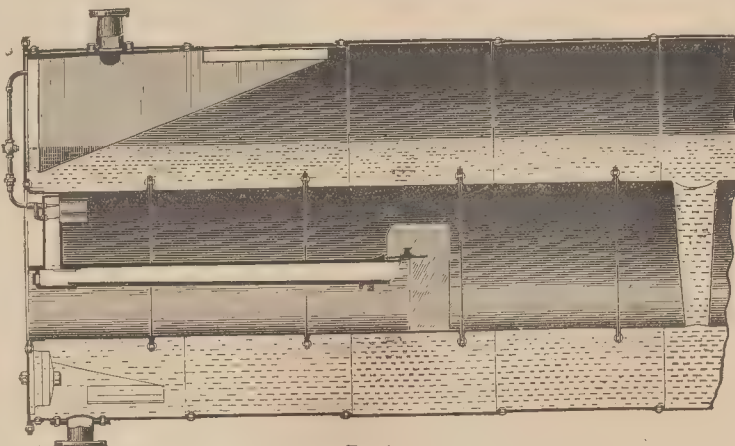


FIG. 1.

cloth for this purpose, but the one which he recommends and has found to be efficacious is to take the cloth after it has been completely finished and glossed in the usual manner, and to place it in its folded state in a hydraulic press and to apply a moderate pressure thereto. The bottom plate or table of this press is made hollow and perforated, and while the cloth is under the hydraulic pressure, steam at a pressure of about sixty to seventy pounds or more to the square inch is admitted into the

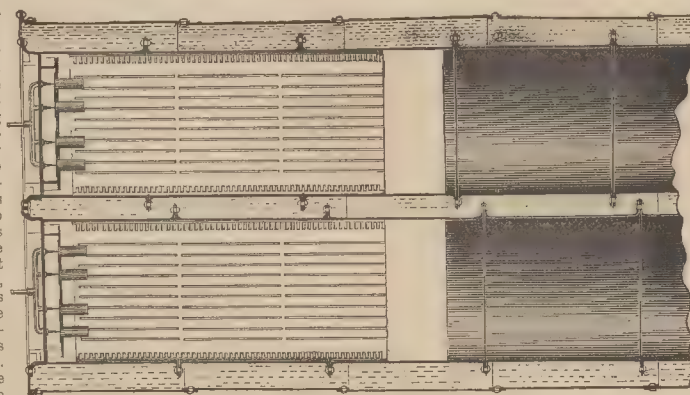


FIG. 2.

consists in the application to the cloth, after it has been glossed and finished in the usual manner, of steam under considerable pressure, say from sixty to seventy pounds to the square inch. This application of steam under pressure to the glossed and finished cloth will be found to fix the gloss and to prevent the same from being made dull or removed by the application of water, steam, or other moisture thereto, and, by this means, the principal defect of this kind of cloth is entirely obviated, and its value is, consequently, increased. The patentee does not bind himself to any particular method of, or apparatus for, applying steam under pressure to the

hollow perforated plate, and is forced by its own pressure through the mass of folded cloth, and thus the gloss is permanently fixed on the face of the fabric, and will not be removed or deteriorated by the application of water, steam or other moisture. There are a great many kinds of cloth manufactured at the present day that have a polish or gloss imparted to them, this system will, therefore, undoubtedly be of great advantage to manufacturers of these fabrics, as they will be enabled to finish them in a more satisfactory manner, with very little extra cost, and at the same time be able to guarantee a durable and permanent gloss or polish.]

## Finishing Italian Cloths.

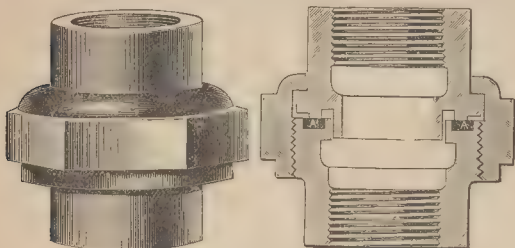
A patent has been granted to Mr. G. Urbain, of Manchester, for an improved method of finishing Italian and other cloths that have a gloss or polish imparted to their surface by hot pressure. This gloss or polish as ordinarily applied and finished is liable to be removed and the surface made dull by the application, accidentally or otherwise, of water or moisture thereto, such as would be the effect of exposure to rain, or of being damped and ironed in the process of finishing a garment, and it is to remedy this defect in the finish, and to prevent the gloss or polish from being removed by moisture, that this invention is designed. The invention

## Glasgow Exhibition.

### MESSRS. LANCASTER AND TONGE'S SPECIALITIES.

The firm of Messrs. Lancaster and Tonge, Lancaster Works, Pendleton, Manchester, who are well known for having had excellent displays of their specialities at recent Exhibitions, have a special show of their manufactures at Glasgow, a great portion doing practical work, leaving the visitors to form their own opinion of their utility. For the purpose of draining the main piping at the Exhibition, they have fixed fifteen "Lancaster" steam traps. The speciality of the traps consists in the loose disc valve at the orifice of the discharge pipe, in connection with a quick thread screw motion worked by the float. This valve is frictionless in action, and being loose cannot stick to its seat. It is very prompt in its movements for opening and closing the discharge pipe, and the working parts are simple and easily examined. It also acts as a safety valve, as any excessive pressure exerted against the face of the loose disc valve would, by virtue of the quickness of

the screw thread, force it open. This trap requires no adjusting under varying pressure of steam, and is, therefore, more reliable than those on the expansion principle, as when sent from their works it will act equally well at varying pressures of steam up to tools. They also exhibit the "American" Union, an extra heavy malleable iron union, which requires no packing, nor preparation of any kind, to make a perfect and permanent joint that will withstand the action of steam, water, gas, acids, oils, &c. This union, which is illustrated, is made with special tools, and is so accurately fitted



A glance at section cut "A" will show the bed of anti-corrosive metal, and the manner in which joint is made.

that it is only necessary to screw up the nut, until the two halves meet, without using force to obtain a joint that will remain perfect for an indefinite period. For connecting pipes under ground, or in any wet or exposed situation, this fitting will be found entirely reliable, while the convenience of having unions always ready for instant use, without the trouble, delay, and expense of cutting rubber or leather gaskets, will more than compensate for

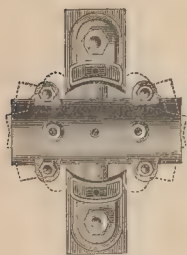


Fig. 1.

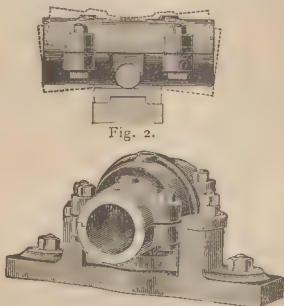
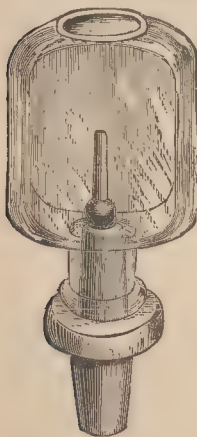


Fig. 3.

Patent Adjustable Bearings.

their slightly increased cost above the common socket, thus preventing any chance of stoppage of valves, steam traps, &c. All the shafting in the Exhibition is fitted up with patent adjustable bearings made by this firm, no fewer than 107 being fixed on the main shafting. An idea of the bearings may be had from the engravings. Fig. 1 shows how horizontal action is obtained, Fig. 2 how vertical action is obtained, and Fig. 3 gives a perspective view of pedestal. With these engravings, it is almost unnecessary to explain how the pedestal acts. It will be seen that the strain is equal on all parts, and the bearing is able to swivel in any direction. It will give, with the motion of an untrue shaft caused by an overtight strap, crooked couplings, &c. It reduces the labour and skill required in fixing to a minimum, and causes a large saving in driving power and lubricant. The firm also exhibit the "Lancaster" Vibration Lubricator, which works on part of the shafting. These lubricators are worked by the vibration of the shafting, there is, therefore, no danger of the oil escaping when the machinery is not in motion. The wooden plug is bushed with a brass bush, and faced true, thus forming a seating for the cylindrical valve. There is a small rod in the centre which prevents the valve from falling off its seat, whilst the cone on the top materially assists its oscillation on its seating, thus allowing a very small quantity of oil to escape. The valve is made of special metal, so that, no matter how inferior an oil is used, it will not clog. They also show other specialties, to which we may refer in another issue. We may add that Messrs. Lancaster and Tonge send out all goods on approval, this fact being a good guarantee of their efficiency for the work they have to do.



The Vibration Lubricator.



## The Brussels Exhibition.

MR. GEORGE HODGSON, LOOM MAKER, BRADFORD.

We have given particulars in our pages of the various exhibits at the Brussels Exhibition which are interesting to our readers, but there is one important display to which only a short reference has been made, that is the exhibit of Mr. George Hodgson, Loom Maker, Bradford, it consists of no fewer than six looms, which show considerable enterprise on the part of the Exhibitor. These are a circular box loom, a worsted coating loom, a heavy circular box pick and pick loom, a light circular box pick and pick loom, a rising box cloth loom, and a Bradford plain loom. We append a short description of these looms in the order given—The circular box loom is a patent contrivance to weave checks, plaids, or stripes, and will produce any pattern of even picks up to six colours without stopping the loom to make the change, and will revolve or remain stationary at pleasure while the loom is weaving. On this kind of loom, a patent lock is applied to prevent the box from turning too far, as well as a motion for throwing the card cylinder out of gear when the loom stops, so that the inconvenience of having to turn the cylinder back is avoided. The worsted coating loom is an 8/4, 76 in. reed space, plain fast reed coating loom, solidly constructed for weaving cloths with one shuttle. The crank and tappet shaft are made of suitable strength for the work, and there are gearing wheels at both sides. The hand tree and going parts are lined with heavy wrought iron angle plate, the top rail and other parts are proportionately strong. A 16 shaft, double lift positive shedding motion is applied to this loom, so that an extensive range of patterns can be produced on it. This loom, though weaving with a large shuttle, can work at the rate of 125 to 130 picks per minute, nor is there any jar about the running of the going part at the time of picking, which is performed with such ease that it is almost impossible to feel from which side the shuttle has been sent. The heavy circular box pick and pick loom is an 8/4 loom, with a six-holed circular box at each end, independent of one another, for weaving with large shuttles to produce fancy cloths, which require a number of single picks to form the pattern. It is fitted up with eight jackrods and treadles, but shedding motions or jacquards can be applied when necessary. The picking motion presents several advantages worthy of notice. It is on the sliding tappet principle. A double hooked spear rod is lifted at every pick, between two pegs, on a rocking plate at opposite sides of the centre, coming in contact with one or other as the pattern demands. Cast on to the rocking plate is a big bevel wheel which gears into a little one, half the size. The latter makes half a revolution at each change, causing a pin on the rim of same to have a traverse or stroke of about 2 inches. This motion is transmitted by means of a short connecting rod to the square slide rod which connects the two tappets. Should the cone or anything else prevent the tappets from changing, there is a patent escapement in the square rod which prevents any breakage. Supposing the weaver, from any cause, such as finding the pick, should require to run the loom without the shuttles being sent across, he can throw the picking out of gear. Every thing about the loom works steadily and accurately, doing its work efficiently, the treading tappets being drawn out especially well, with mathematical precision. The light circular box pick and pick loom is similar to above in general construction, but is especially adapted for light fancy dress goods. The rising box cloth loom has a four holed independent drop box on each side, capable of being changed from one shuttle to any other in the series, just as the manufacturer may wish. It is fitted up with a 24 shaft positive dobby, which retains the heads up or down without moving, when required, twice in the same position. The box motion, picking motion, and shedding motion are all in one frame, and both cylinders are keyed on to the same shaft, so as to prevent the possibility of the weaver getting the two sets of cards across, and thereby putting the filling into the wrong shed. There is a motion applied to it for reversing the cards and weaving backwards to find the pick. Compound eccentrics are used for moving the boxes, which are forced both up and down. The picking is from underneath. It is the cone pick reversed, and is remarkably easy in its working, and can be thrown out of gear when desired. The heads can be levelled at any time by means of a lever, which goes back into its place when the loom is started. When taking out the heads after a warp is finished, the necessity for untying all the knots is done away with. By means of a handle all the bands can be slackened at once, ready for unhooking. The plain Bradford loom is well adapted for weaving either silk, mohair, cotton, alpaca, or merino. It can be fitted up with as many as ten treadles, also jacquards for weaving figures, or patent shedding motions from 10 to 20 shafts can be applied with the greatest ease. The loom exhibited is fitted up with only two shafts for weaving orleans, to show the exceedingly high speed that can be attained by well-adjusted machinery. A similar loom to this was exhibited at the International Exhibition in 1862 (London), and ran at upwards of 450 picks per minute, at the same time producing good cloth. It was, however, only for an experiment, for so great a speed could not be introduced as a regular thing. Mr. Hodgson has a similar exhibit at the Barcelona exhibition.



## PATENTS.

### Applications for Letters Patent.

Actuating dabbling brushes of combing machines. O. B. Lister and H. Batty, Bradford.	3rd July	9,633
Automatic stop motion for jacquards. B. and B. Green and C. Barker, Keighley.	12th July	10,127
Adjusting position of loom temples. G. Keighley, Halifax.	17th July	10,333
Actuating jacquard, &c., machines. C. H. Priestley and S. and W. Deighton.	20th July	10,507
Application of cloth upon silk net or tulle for embroidery. T. Bills, London.	26th July	10,796
Beds of cloth cutting or shearing machines. W. Cockroft, London.	4th July	9,723
Bleaching oily cotton waste. F. Law, Rochdale.	21st July	10,560
Construction of bundling presses for compressing yarns. J. Corrigan, Manchester.	5th July	9,789
Carding engines. J. Hague, Ashton-under-Lyne.	6th July	9,833
"Comb-beater" for beating fibres. J. Hague, Ashton-under-Lyne.	7th July	9,875
Cleaning hackle pins while at work. J. M. Grieves, Belfast.	10th July	9,990
Connecting belting. J. H. and J. H. F. Cohrs, London.	10th July	10,033
Clearing yarn and thread. E. Knowles, London.	12th July	10,142
Consumption of fuel and smoke preventing. G. Kendall, Huddersfield.	16th July	10,272
"Cheese-builder" for sectional warping. J. Stanley and J. Vickerman, Leeds.	17th July	10,330
Carding engines (improvements in) partly applicable to scutchers and other preparing machines. S. H. Brooks, T. Goodbehere, and G. Shaw, London.	19th July	10,479
Colouring matters. H. H. Lake, London.	26th July	10,845
Drawing slivers from gill boxes, &c. T. H. Ackroyd and A. Broadley, Bradford.	30th June	9,527
Drying bleached or dyed yarns. T. Hill and T. Mayfield, London.	4th July	9,729
Driving apparatus for carding engine rollers. W. T. Raynor and H. Davenport, Manchester.	18th July	10,416
Dobby for operating healds. R. H. Place, Halifax.	25th July	10,739
Figured quilts, &c. T. and W. Holt, Manchester.	30th June	9,525
Finishing textiles. J. and M. S. and J. Sharp and J. Casson, London.	5th July	9,787
Fancy or two colour yarns or fabrics. W. P. Thompson, Liverpool.	12th July	10,155
Fabric gloves. R. G. Kipling, London.	21st July	10,600
Holding "Mandozza" weight in position while the carriage of mules is going out. J. W. Wooler, Ashton-under-Lyne.	30th June	9,522
Hardening and tempering "Garnett" saw teeth. E. and D. Sykes, Halifax.	12th July	10,124
Heat and fuel economiser and smoke consuming apparatus. J. Battye, Batley.	20th July	10,946
Inlet ventilators. T. G. Normanton and S. E. Major, Barrow-in-Furness.	26th July	10,805
Jacquard apparatus for weaving carpets and other figured fabrics. S. Holdsworth, London.	20th July	10,811
Lubricating composition. W. T. Hicks and J. Elliott, Middlesboro'.	29th June	9,477
Looms for weft fur. T. Cooper, Birmingham.	29th June	9,481
Lubricators. E. Baldwin, Loughborough.	30th June	9,537
Looms. C. Wells, London.	30th June	9,537
Looms. C. Catlow, Halifax.	4th July	9,758
Looms. G. Halstead, Manchester.	6th July	9,837
Lace curtains. R. F. Carey, London.	12th July	10,122
Lubricators. H. N. Bickerton, Ashton-under-Lyne.	7th July	9,909
Loom for simultaneously weaving two or more pieces of fabric. H. R. Lister, Huddersfield.	14th July	10,228
Looms. F. W. Jepson, Halifax.	19th July	10,453
Looms for changing speed, applicable to warping, spinning, winding, spooling and glazing machines, and bobbin frames. C. J. Dumoulin and J. Lauriot, London.	21st July	10,562
Machines for paper tubes for yarns. S. O'Neil, R. Livesey, H. Dean, J. R. Wright and T. Farrow, Manchester.	5th July	9,772
Methylene blue, &c. J. Y. Johnson, London.	16th July	10,314
Metal ends for heald shafts. H. B. and A. B. Barlow, Manchester.	19th July	10,464

Metal belting for machinery. W. G. Cowlishaw, Longport.	24th July	10,675
Making lace and machines therefor. J. Gebbie and T. Mitchell, Glasgow.	26th July	10,809
New fibre and process of producing same. C. Huelsner, London.	25th July	10,758
Oil cans. H. Jones, London.	13th July	10,218
Printing fabrics. B. Copperthwaite, Glasgow.	30th June	9,517
Printing floor cloths, &c. J. Wright, Glasgow.	30th June	9,530
Pegs and method of securing to lags. N. and F. Hill, Halifax.	5th July	9,779
Pickers for looms. J. Oldfield, Glasgow.	5th July	9,791
Production of grease for lubrication. W. Walker, Longport.	5th July	9,794
Pulleys—applicable as rotary fans. P. Wood, Halifax.	10th July	9,987
Preventing or consuming smoke and economising fuel. R. Macintyre, Sheffield.	17th July	10,331
Pickers for looms. H. Armistead and J. Dawson, Blackburn.	19th July	10,458
Pulleys. A. Paget, Loughborough.	21st July	10,570
Pickers for looms. J. Greenwood, Manchester.	25th July	10,753
Rollers for preparing, drawing, doubling, &c., fibres. H. and J. S. Broadbent, R. Gregory, and S. Holden, Manchester.	29th July	9,479
Rings for ring spinning, &c. R. A. Johnson, Manchester.	26th June	9,495
Reversible carpet or rug. J. Crabtree, Halifax.	14th July	10,229
Ring spinning and twisting. A. Whitaker, London.	19th July	10,470
Rolling or breaking flax and other fibrous substances. J. McKelvey Horner, London.	23rd July	10,635
Roving or intermediate frames for preparing fibres. W. P. Thompson, Liverpool.	24th July	10,693
Self-acting mules. J. Hoyle, A. R. Murphy, and J. Wild, London.	29th June	9,483
"Scrays" used in steaming printed yarns. R. Webster, Halifax.	30th June	9,538
Separating short fibres of cotton from waste. H. H. Lake, London.	3rd July	9,619
Sight feed lubricators. W. James, Chester.	6th July	9,841
Shuttles and bobbins—holding bobbins in shuttles. W. and G. Hilton, Manchester.	9th July	9,932
Spinning, twisting, &c. W. P. Thompson, Liverpool.	13th July	10,191
Spinning machines. E. de Pass, London.	13th July	10,205
Self-acting burring and cleaning machines. A. Granville, London.	13th July	10,213
Self-inking or colour printing surfaces. E. Edwards, London.	13th July	10,214
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8,256	8,258	8,721	8,777	8,815	8,974	8,979	9,029
9,043	9,087	9,223	10,992	14,477	15,865	14,533	14,715
4,305	8,725	8,727	8,744	9,218	9,257	9,279	9,350
9,350	9,434	9,439	9,503	11,472	2,478	2,532	2,623
3,907	4,380	4,703	4,926	5,035	1,816	7,844	8,128
8,161	8,417	9,513	9,615	9,661	9,989	10,070	10,672
11,187	13,690	3,154	4,925	4,973	7,326	7,922	8,562
8,054	9,315	9,432	9,762	9,931	10,025	10,045	10,088
10,113	10,650	15,861	16,856	17,652	1,607	5,585	5,736

# The Journal of Fabrics AND Textile Industries.

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## Notices.

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## The Latest Inventions in Fabrics.

Manufacturers and merchants are, doubtless, always glad to hear of any new departures in the way of fabrics, and as there have been several recently patented, which we consider of sufficient importance to be mentioned in our pages, we have pleasure in bringing them before the notice of our readers, who, we have no doubt, will find the descriptions of interest to them. These embrace carpets, quilts, mantle, &c., cloths, cotton cloths, and waterproof and openwork fabrics. Whilst upon this subject, we may remark that a certain section of manufacturers and merchants have, for some time, been eagerly looking for a new cloth, upon which the public would look favourably, as a substitute for tapestry for curtains, table covers, and piece goods. These materials having had a most successful run for a number of years have long ago seen their best days, and something is now required to replace them. Having said so much by way of introduction, we will proceed at once to describe the latest inventions in fabrics.

### WOOLLEN AND SILK EFFECTS ON WATERPROOF FABRICS.

For producing and treating waterproof fabrics, in order to give them warmth and a silk or woollen effect, a patent has recently been granted. In carrying out the above object, the inventor uses a figured or printed fabric, which he coats with a flexible dressing of a similar nature to

that employed in producing the goods known as "sateen," and when so desired, "sateen" is used in lieu of other fabrics. A composition for this purpose is made by dissolving a given quantity of gelatine in water so as to produce a size. To this is added a solution of aluminium sulphate, then it is well stirred. Baryta, dissolved in water, is added, and the whole stirred till cold. The proportions will vary according to the uses to which the composition is to be applied, but the following will answer well:—concentrated size—eight pounds dissolved by a little heat in sixteen gallons of water, to which are added five pounds aluminium sulphate, and six pounds barium chloride, this is stirred till nearly cold. Or, instead of the above, the following may be used:—concentrated size—eight pounds dissolved by a little heat in sixteen gallons of water, to which are added seven pounds of sulphate of zinc, and ten pounds of ammonium sulphate. The fabrics are next coated with a drying oil as free as possible from smell, then dried or "stoved" in the ordinary manner, or with a transparent flexible varnish, whereby they are rendered still more water repellent, whilst retaining the warmth and texture of the fabric. The varnish for this purpose should be free from smell, and capable of being applied in a very thin coat. It should also, in certain cases—as when the fabric is to be used for book covers—be capable of receiving impressions, either plain or in gold, silver or metal, without sticking to a heated block or roller. The varnish preferred is prepared by melting together 22 lbs. colophony, 4½ lbs. crystallized soda, and 1½ lbs. water; to this is added 55 lbs. water and 5½ lbs. ammoniacal fluid, the whole being thoroughly mixed. Another varnish suitable for the purpose consists of a solution of borax and shellac. This is made by boiling the shellac with water, then adding borax till it has the appearance of damp crystallized sugar; this must stand about twelve hours and then be shaken. The proportions may be borax—six pounds, shellac—six pounds, water—forty pounds. When the fabric is to be used for book covers, the ordinary paste dressing may, in some cases, be used, and the oil or varnish applied after the material has been calendered.

When using sateen for book covers, the face side is coated with the oil or varnish, and the reverse side with paste, or with a waterproofing matter, such as india rubber, or those used for forming the ground or body of leather cloth, and then embossed. When it is to be used for articles of clothing, linings, curtains, furniture and other coverings, or certain other purposes, the sateen, or similarly dressed fabric may, in some cases, be simply coated on the face side with the oil or varnish, or it may be saturated therewith, then rolled or pressed with plain or figured plates or rollers, either cold or heated, by which means the superfluous varnish taken up will be pressed out, and at the same time a pattern imparted to the fabric. For most purposes, it is preferable to coat such fabrics on the reverse side with india rubber, or other waterproofing composition, such, for example, as are used as a ground or body in leather cloth, and then emboss. The silk-like effects are further produced on the face of the sateen, or similarly treated fabrics, by embossing them with electrotype plates or rollers taken from silk, or other expensive fabrics, with or without a colouring matter, such as bookbinder's blocking varnish, or by blocking or printing a series of curved or straight lines, or a silk like pattern thereon. In order to give warmth and a woollen like or silk like effect to the side of the fabric coated with india rubber, or other waterproofing composition, the india rubber face is coated with glaire, and printed or blocked with bookbinder's blocking varnish, or like matters. Or the india rubber, or similar face, is printed or blocked with bronze powder, gold, silver, or metal, from heated or cold blocks or rollers. Then the fabric may be embossed to imitate silk, leather, woven horse hair, or other comparatively expensive material, by means of plates or rollers produced by the electrotype process, or otherwise. The before-mentioned effects may also be produced, and the fabrics further improved, by applying to the india rubber or other waterproofing or coating composition while in an adhesive state, a film or batt of silk, wool, or other material. When necessary, the india rubber or other coating of waterproofing matter is vulcanized. It will be seen that the desired novel effects may be obtained without employing all the above processes in every case. For example, the embossing of the fabric, treated with a flexible dressing, then with oil or varnish, may, in some cases, be dispensed with, in others, the printing or the coating of rubber or equivalent composition.

### NEW PILE FABRICS FOR CARPETS, RUGS, &c.

This invention is for the manufacture of a new kind of pile fabric, composed of threads of various colours, suitable for carpets, rugs, and other goods, the new fabric having a novel and variegated, or mottled and soft effect, of a durable character. When cut pile fabrics are woven with the pile warp or warps composed of ordinary dyed threads of worsted, mohair, or other suitable material, as long as the pile remains erect, and the ends of the fibres composing the pile are exposed to the light, there is very little lustre to be seen on the face of the fabric, but when the pile is flattened, and the sides of the fibres composing the pile become more exposed to the light, more lustre is visible on the face of the fabric, and the shade of colour appears to be lighter than when the pile was erect, but, in both cases, any lustre which there may be is equally diffused throughout the whole surface of the fabric. In manufacturing this new fabric, the pile is formed, as hitherto, by means of threads of different colours, the threads which have to be lifted to form the required pattern being selected and operated by means of the jacquard or other similar

machine, or by beads, whilst those threads which are not required to form the pattern remain buried in the back of the fabric, but, according to this invention, in order to obtain a variegated or mottled effect, in which shall be combined the appearance of the erect pile with the appearance, colour and lustre of the flattened pile, the warp, forming the pile threads is composed of different colours of mohair, worsted, or other suitable material which, in addition to being dyed, are also so prepared as to produce a double curl or wave in the yarn. The yarn is rendered curly or wavy by any known method, such as by knitting, plating, or by twisting a number of threads together, and the curl or wave may be fixed by boiling or steaming, or by subjecting to heat whilst in a damp state, or by any other suitable method. By the use of such prepared yarn, the curl or wave therein, when the pile is cut, exposes in some places the ends of the fibres forming the pile to the light, and in other places the sides of the fibres forming the pile, and in this way a beautifully variegated, or mottled, and soft effect is produced. The pile warp or warps can be formed exclusively of wavy or curly yarn, or of these yarns in some parts of the pattern, and of ordinary yarns in other parts of the pattern, and the pile may either be cut throughout the whole of the pattern, or may be cut in some parts and uncut in other parts of the pattern.

#### COTTON CLOTH FOR SPECIAL PURPOSES.

A cotton fabric has been the subject of a patent, which has the appearance and soft feel of chamois leather, and which is guaranteed not to lose its special qualities when washed. In making the cloth, cotton yarns form the warps, these being dyed a fast colour, a chrome yellow tint being preferable; they are sized and dressed in the usual manner. The weft is spun soft, and is used in the undyed state. The fabric is woven from these yarns, and then is passed several times through cylinder teasing or raising machines, whereby the surface is broken and a good ground nap is produced on one or both sides thereof. The fabric is then "soap" finished to impart to it the desired appearance and soft cold feel of chamois leather. It is applicable for either wet or dry cleaning purposes, and also as a polishing cloth, and is specially suitable for underclothing, and for linings of the same, and for general use as a substitute for the chamois leather now used for these and for analogous purposes. Being moreover of a woven texture and absorbent, it is more healthy for use in garments than chamois leather, and does not require to be perforated. Unlike leather also, which goes stiff after washing, this improved material so produced is capable of being repeatedly washed without stiffening, and is found to retain its softness perpetually.

#### FIGURED CLOTH SUITABLE FOR MANTLES, DRESSES, OR UPHOLSTERY.

A new or novel fabric has recently been patented, which is adapted for mantles, dresses, &c. The cloth is woven in the ordinary manner of double cloths, that is, consisting of two separate or distinct fabrics, exchanging places in such manner as to form figures, and bound together at suitable intervals, or it may be woven on the principle set forth in the specification of Thomas Taylor, and Jacob Warburton, A.D. 1881, 10th May, No. 2196, and upon this plan by preference. In the weaving, the ground or figure, or both, may form plain, twilled, or other suitable form of interweaving. In the production of the cloth, two distinct classes of material are employed, one for the ground or body of the cloth, and the other for the figure, such as fine, soft wool and mohair, fine, soft wool and alpaca, fine soft wool and silk, or cotton may be substituted for the fine wool, or cotton and linen may be combined. The object of this combination being that one portion of the cloth shall be dull and of such a nature that it will shrink considerably in the process of dyeing or finishing, and the other portion shall be bright and lustrous, and possess shrinking properties in the smallest possible degree, thus making a marked distinction between the figure and the ground of the cloth.

#### FIGURED QUILTS AND SIMILAR FIGURED FABRICS.

This invention relates to figured quilts and similar figured fabrics, which are ordinarily woven with two yarn beams, and with successive picks, or series of picks, of fine and of coarse weft. The warp from one of the beams is employed in the production of the figure, and is called "face" yarn, the warp from the other beam is employed in forming the ground, and is called the "stitching" yarn. Various combinations of numbers of the ends of the face and stitching yarns respectively have been employed, but they have, in all cases, either been equal, or two to one, and the fabric has, consequently, had a uniform, or comparatively uniform, appearance in the figured or plain portions respectively. The improvements have for their object to produce a distinct and more pleasing appearance in the fabric, and this is accomplished by using a warp containing a larger number of ends of stitching yarn than has, heretofore, been employed, but not more than four such ends or threads, to one end or thread, or to two ends or threads, of face yarn. When four ends of stitching yarn are employed together, the series of four ends are alternated with a series of two ends of face yarn, and when three ends of stitching yarn are employed, one end of face yarn is used in combination with each set or series of three ends of stitching yarn. The warp may be upon one beam only, but two beams are preferred, as is usual in weaving similar fabrics when the stitching yarn is wound upon one beam and the face yarn upon the other beam. The weft may

be alike throughout, or one or more picks of coarse or face weft may be alternated with one or more picks of fine or ground weft, as may be required by the pattern or design of the fabric, or by the effect which it is desired to produce.

#### ORNAMENTING OPENWORK FABRICS.

A process for the ornamenting of tulle and such like openmeshed fabrics consists in depositing drops of a prepared liquid on the tissue whilst stretched out and held by the edges. These drops penetrate the openings or meshes of the tissue which they fill, attaching themselves to the threads of the meshes, and remaining suspended. Whilst in this position, evaporation is effected, and the drops of liquid are transformed, losing by degrees their spherical form, and leaving on the threads, after desiccation, an ornamentation in the form of small rings. On certain nets, such as tulle of the "Zephyr" or "Alençon" description, the decoration sometimes assumes the appearance of small stars, but always with holes in their centre, and on square meshes it is slightly of that shape. It will be readily understood that the liquid employed to realise this product requires very careful and entirely special preparation in order that the non-vapourisable bodies contained in it shall be attracted to the threads, and give them a thickness or a colouring. The liquid is composed as follows:—In 800 parts of water, two parts of mucilage are dissolved, and to this are added 10 parts of a very fine non-soluble powdered body. The bath is completed by the addition of 200 parts of alcohol. The mucilages or thickeners which may be employed are gumtragacanth, gum bossora, &c. As regards the powdered bodies, they are chosen in the colour or shade required. For black shades—ivory black or lamp black is employed; for white—zinc white, white lead, Barytes white, alumina, China clay, magnesia, and others. These white bodies may be coloured by the addition of any soluble, thus allowing a considerable number of colours or shades to be obtained without the necessity of the powders being actually of the colour required to be given to the ornamentation. The choice of powders is, however, of some importance by reason of their density; those whose weight approaches nearest to that of the liquid being preferred, so as to avoid the necessity of stirring or agitating the bath, as is the case with powders heavier or lighter than the liquid. Spermaceti, stearic acid, and resins reduced to powder, give good results, and these powders are also easily coloured. The ingredients and proportions of the bath may be varied or modified as necessitated by the nature or kind of tissues, the large or smaller openings of the meshes, the nature of the threads, silk, wool, or cotton, their varying thickness, the amount of relief to be obtained, the size of the central aperture of the ornamentation, all these necessarily influence the proportions of the substances to be introduced in the bath, but a little experience will overcome difficulties of this kind which may arise, if the functions of each of the elements which compose the bath are taken note of. The function of the water, which has to disappear by evaporation, is only to serve as a vehicle for the other substances; that of the mucilage is to give adherence to the ornamentation. If the latter becomes detached from the threads, the mucilage is too weak, but if, on the contrary, the drop produces a membrane, and does not form an opening in the centre, the proportion of mucilage is too strong and should be diminished. The powdered substances are intended to give thickness to the threads, and should the relief be too high or pasty, the proportion should be diminished, but if the ornamentation is not bold enough, it should be increased. The application of the liquid is effected by means of bars or battens, with long pins, the thickness of which is so calculated that the size or quantity of the drops on their ends corresponds to the gauge of the meshes. If it is desired to obtain several ornamental rings contiguous to one another, all that is necessary is to deposit drops so as to embrace or cover the united surfaces of the meshes to be ornamented.

#### AXMINSTER OR CHENILLE CARPETS AND PILE FABRICS.

In the manufacture of Axminster or chenille carpets and similar fabrics, as generally practised, the formation of the backing and the securing of the fur or pile thereto, are effected simultaneously in the process of weaving, and the thickness or weight of the backing is limited by the thickness of the weft which can conveniently be carried in a shuttle, whilst the width of the fabric is determined by the breadth of the loom which, for this class of work, cannot advantageously be made of great breadth. An invention has been patented, having for its object the obviating of these inconveniences, and the production of Axminster or chenille carpets and similar fabrics of any required width, and of suitable weight; it consists in the manufacture of such fabrics by securing the chenille weft or fur in rows by sewing threads on to a woven backing, or a series of widths of backing, the stitching on of the fur being effected by means of apparatus specially designed for the purpose. In carrying out the improvements, the backing is stretched from a paced roll or beam, on which it is wound, over a slab or table, to a porcupine roll, which serves to draw up the fabric as it is formed. Over the backing on the slab or table, a needle bar is carried, having in it a row of needles set to any desired gauge, the needle bar being reciprocated vertically, like that of a sewing machine, and the needles passing down through the fabric and through holes formed for them in the table or bed of the machine. The needle bar, with its row of needles, extends the full breadth of the carpet or fabric to be produced, and each of the needles carries a tacking or binding

thread led from a beam or bobbin over a take up bar to the eye of the needle. Underneath the bed of the machine are fitted as many shuttles or loopers, or their equivalents, as there are needles, each shuttle or looper carrying the under thread, and co-operating with the needles to form stitches. The shuttles, when such are used, are made extremely narrow, and carry bobbins or spools, and they are operated in a manner analogous to that in which the shuttles of a lace making machine are actuated, being reciprocated across the row of needles so that they pass through the loops of the needle threads, when the needles descend and form stitches. One row or shot of the fur is stitched or tacked on at a time, the fur being laid either by hand, or by a mechanically operated guide running from side to side of the apparatus, and being properly placed by an attendant in front of a pusher bar, which is reciprocated horizontally in front of the needles by suitable mechanism, and beats up the fur against the preceding shot. To obviate the necessity of combing up the fur, the needles are only raised to about midway of the thickness of the fur, so that they form tracks for the needle threads, which lie in grooves, or cut away portions of the needles, and follow their points. Whilst the needles are raised, the backing is drawn forward by the porcupine roller to the extent of the breadth of one fur shot, and the pusher, which is grooved or indented to make way for the needles, follows up the fur, which is pushed up to the back of the needles. The needles then descend in front of the fur through the grooves or dents in the pusher bar and through the backing, and the fur shot is firmly tacked down by the shuttles passing through the needle loops to form stitches. The needle bar is operated, through suitable links or levers, from cranks or eccentrics or other devices, and the shuttles are, or may be, thrown by long pinions or grooved bars, on each side of the needles, acting on teeth on shuttles. When loopers are used for the under threads, they may be carried upon a bar having imparted to it by suitable mechanism the reciprocating and lateral movements requisite for the formation of stitches with the needle threads. In a modified arrangement, the needles are turned so that the loops are all thrown to one side of the row, and a hooked wire is thrown across the whole width, between the needles and their loops, to draw a double thread through the whole of the loops, thus tacking them all down.

### Consular and other Reports.

**HINTS ON BUSINESS IN ZANZIBAR.**—A gentleman writes that although Zanzibar offers a wide field to European merchants, British houses are only doing a very small portion of the trade. The following hints will be found useful to those who are studying this market. The large European houses established in the province of Mozambique very seldom treat direct with the natives, but through the Moors, Hindoos, and the privileged dealers, who act as middlemen. Hindoos are found everywhere, even in the remotest parts of the country, and are the most active agents on the East Coast of Africa. The use of money is unknown in the interior, where trade is carried on by barter, not only between the black population and the middlemen, but also between the latter and the large European houses. The French factories are the most important, the principal house being that of Mante Bros. and Borelli de Regis, of Marseilles. The latter carries on an extensive business, and has been established in the country for the last 50 years. It has branch establishments at Ibo, Quilimane, Macusa, Chilcano, Inhambane, and Lorenzo Marques, and deals in all articles of importation and exportation, with the exception of ivory, which is entirely in the hands of the Hindoos. Fabre and Son, of Marseilles, rank next; and a considerable amount of business is also done by Messrs. Philipp, of Hamburg; the Dutch East African Company, of Rotterdam; the African Lakes Company, of Glasgow; Deuss and Schultz, of Hamburg; and Correo and Carvalho, of Lisbon. Most of these firms maintain branch establishments in the provinces. The retail trade is nearly entirely in the hands of Hindoos, whose shops are well kept and supplied with all kinds of European and Indian goods required on the East Coast and the interior of the country. With regard to the imports, calicoes, sheetings, shirtings, bleached cottons, and fancy handkerchiefs are imported from Great Britain. Smooth cotton stuffs come chiefly from the United States. Clothing in bright colours, which is used to make turbans and cassocks, is furnished by Switzerland, India, and Great Britain. Metallic wire, iron and copper bars, coming from Germany, are also important articles.

**A GLANCE AT SALONICA AS A MARKET.**—A HINT TO CLOTH MANUFACTURERS.—A correspondent in Constantinople directs attention to the class of goods for which a constant demand exists in Turkey, but more especially in the Salonica market. The leading articles required for the trade there are hosiery, cotton goods, horse hair, drapery, ready-made clothes, woollen yarns and tissues, indigo, goat's hair, and silk goods. The market, to a great extent, is held by French dealers. Italy is, perhaps, her most formidable competitor in European products; the rest of the trade in this branch being left to Austro-Hungary and Great Britain, but, owing to the commercial crisis through which Macedonia has been passing for the last few years, even this remnant has been gradually diminishing. Cereals form the main staple of what Salonica has to offer in the exchange of trade, and, as her only outlet just now is Asia Minor, it follows that European imports must suffer. The trade reports for last year give importations from France at a little over

7,000,000*fr.*, and exportations to France at over 10,000,000*fr.* It ought, however, to be borne in mind that these figures show a large falling off when compared with the year 1886. Italy beats France in one article only, namely, cloth, the reason being that the requirements of the trade having been carefully studied, Italian firms supply a light, suitable material at a very low figure, comparatively speaking (8*fr.* to 10*fr.* per yard). Black, grey, and maroon are the colours most in demand, but small checks sell well. Cloth manufacturers who propose trying the pulse of this market should have the pieces measured to metres, and mark each metre. Most of the woollen, cottons, and unions come from France. The market for cheap novelties is gradually expanding, but it should always be remembered that a low figure is the mainspring of trade over here. The buyer does not look beyond the moment, he cares little for any special warp or weft, or even permanency of dye, he wants a showy article for a minimum outlay.

**THE DEMAND FOR SILK GOODS IN MEXICO.**—A correspondent in Mexico says that, year by year, the demand for silk tissues of various descriptions is increasing in Mexico. Supplies reach them from Great Britain, Germany, Italy, France, and China. The principal descriptions are the gros grain plain black, supplied from France, in pieces 70 to 80 metres long, running from 46 to 60 centimetres in width, and ranging in price from 1 to 6 piastres per vara. The most saleable in this class is the medium quality, at about 2½ to 3 piastres per vara. An important article in this trade is the plain damask satin handkerchiefs, used as neckties, which are sold at from 12 to 24 piastres per dozen. The bulk of these, at present, come from Germany and France. They ought to be as light as possible, as the duty on them is assessed according to their weight. Brocatelles for upholstering purposes come from France and Italy, and arrive in pieces 50 to 56 metres long, and 50 centimetres wide, and are valued at 3 to 8 piastres per vara, according as they are made of pure or mixed silk. Bandas de seda, or sashes of China crêpe are very fashionable in Mexico, and are manufactured in China, though they are sold through British houses. Plain sashes are sold at about 18 piastres per dozen, but when embroidered they fetch as much as 24 piastres per dozen. Silk batiste handkerchiefs are almost exclusively obtained from France, and sell at from 2½ to 40 piastres per dozen, though the demand for goods costing more than 20 piastres is very limited. Raso tramado or tabinete is made of a mixture of silk and cotton, and this description of satin is supplied by France and Germany, in pieces 35 to 40 metres long, and about 50 centimetres wide. It is sold in all shades, but bright colours are preferred. Damask goods find the largest sale, as they are used for costumes, as well as for furniture and parasols. Coloured taffeta, in assorted shades, for lining ladies' dresses, is imported from France, in pieces of 60 to 70 metres, and of 0.30 to 0.32 metres in width, and can be bought in Mexico at 2 centavos per vara. Velvet, black and coloured, comes from France and Germany, the most useful width being 50 centimetres. Its price runs from 2½ to 8 piastres per vara. The duty on silk goods of all descriptions is very heavy. Silk handkerchiefs of all kinds pay 9 piastres per kilo, stockings and knitted vests, 16 piastres, rebosos, 16½ to 34 piastres, according to the number of threads in the warp; made up dresses, or parts of the same, are subject to 18 piastres, raw silk to 2 piastres, and silk thread to 8 piastres, all per kilo, net weight.

**BRITISH TRADE WITH CHINA.**—According to a telegram received from Sir John Walsingham, Her Majesty's Minister at Peking, with reference to the navigation of the Upper Yangtse-Kiang, the hostilities of the inhabitants of Chung-Kiang are likely to be overcome. The British Minister having reported to the Chinese Government the facts of the case, negotiations have been proceeding between the former and the latter, the outcome of which is so far satisfactory that the Chinese Government have reported to Sir John that they have succeeded in very considerably diminishing the hostility displayed to the navigation of the river by a British company, and that an Imperial proclamation, enjoining friendly action on the part of the inhabitants towards any of the company's vessels attempting the navigation of the river, had been posted in Chung-Kiang. The British representative found the Chinese ministers extremely well-disposed in the matter, and, although some details still remain to be settled, the hope was expressed by them that the affair would soon be arranged to the entire satisfaction of both parties. The telegram concludes with Sir John's own expression of opinion that the progress, so far, has been quite satisfactory, and he gives hope of the development, at no distant date, of our commercial relations with China.

**HOURS OF LABOUR IN RUSSIAN FACTORIES.**—The Austrian Consul-General at St. Petersburg, in his report for the past year, refers to the establishment of a system of factory inspection in Russia, which has just been a year at work. In reference to the hours of labour, the statistics of 1,214 factories, representing 126 different branches of industry, were examined. These show considerable differences. In the great majority of cases, the women work in common with the men, and the same number of hours. The length of the day varies from six to twenty hours, and, under special circumstances, work is carried on continuously for twenty-four hours. These variations, it is curious to note, occur even in the same branches of industry, in the same district, and even in the same town. Differences amounting to from one to eleven hours are thus found in factories which are similarly situated. The longest hours are found in those factories where the appliances are

primitive, and that belong to owners who know, or wish to know, nothing of mechanical improvements. Factories in which the day lasts from twelve to twenty hours, if not the exception, are at least comparatively few. In 970, or 80 per cent. of the whole, the day did not exceed twelve hours; in 36·8 per cent. it was twelve; in 20·8, eleven; in 18·1, ten; in 21, nine; in 1·6, eight; in 0·4, seven; and 0·2, six hours. Hence, twelve hours may be taken as the average day of the inspected factories. In 247, or 20 per cent., night work was carried on. Here, too, there was an inexplicable discrepancy. In rival factories in the same place, and under precisely similar circumstances, night work would be the rule in some, while it never took place in others. In 906, or 74·46 per cent. of the factories, work began at five in the morning, and ended not later than nine at night. A night's work begins at nine, and ends at nine in the morning. In many cases work begins, not at five, but any hour up to ten o'clock in the morning, and ends between four and nine p.m.

Among imports to Tunis, says the British Consul, a good business has lately sprung up in prayer carpets, measuring a metre long by 0·65 metre wide. It is a stout woven cotton cloth of Manchester manufacture, with the pattern of a mosque, with its minarets, on the upper half, and a chess or backgammon board on the lower. It is sold for one shilling, and leaves a handsome profit.

A Belgian consular report from Tripoli urges upon Belgian firms, who desire to secure a share of the cotton trade of that country, the necessity of giving attention to the lowliness of price of their productions, if they would compete successfully with Manchester firms that have hitherto taken the lead in this the chief branch of trade in Tripoli. Linen and woollen rank next in importance.

### England and Eastern Africa.

#### A NEW MARKET FOR ENGLISH MANUFACTURES.

It has long been the desire of men interested in the various branches of trade to find new channels for the surplus productions of our manufacturing community, and when, in March last, a lecture was delivered by Colonel W. Jasser Coope, before the London Chamber of Commerce, on Amatongaland: its commercial and political importance, it was felt that the central point of the address, viz.:—a new and practical and easy route for a railway from the East African coast to the Transvaal, which had been discovered by the lecturer, who has thoroughly explored the country, was the very thing to be desired. Commercial men, says the *Batley News*, are now taking up the suggestions given in such address, and an effort is being made to open up that new portion of South Eastern Africa—the key to the Transvaal—styled in Colonel Coope's address "Amatongaland," or, as it should be called if correctly described, "Mapootaland," as an important market for the products of the Northern Counties especially. Great concessions have already been obtained there by a syndicate of bankers, merchants, and financiers in London, the North of England, and Paris. These gentlemen have purchased the rights from the native government for the construction of harbours, docks, and canals, for improving the navigation of the rivers, and last, but not least, for the construction of a main line of railway, from any harbour they may select, to the interior of the continent. This projected railway will be about 160 miles in length, through a very healthy district, and will open up, not only Mapootaland, but Swaziland, and the gold, coal, pasture, and timber, districts of Mapootaland and the Transvaal, and will form an important connecting link in the chain of roads for the iron horse, designed to connect the Zambezi—the field of the labours of the renowned Dr. Livingstone—with the coast. Along the route of this line, the syndicate have obtained strips of land of two and five miles in width respectively, which will one day prove to be a valuable acquisition to the company. It may here be mentioned, in connection with the manufacturing districts of Yorkshire, that some of the best wools used in the woollen trade are grown in the Transvaal, but the cost of transit by the present route—Delagoa Bay—£20 a ton to London, is a very serious drawback. But instead of the wool being carted over these mountain ranges, at a cost of 2d. to 2½d. per lb. for carriage before it arrives at the sea coast, by the new railway, the cost will be but ½d. per lb. If to this be added another ½d. per lb. for the freight to London, it will thus be seen that the wool from the Transvaal can be brought into the London market, at something like £13 a ton less than it is at the present time, a fact so important in itself that it needs no comment. Apart, however, from the advantages to our trade locally, looking at it in a broader sense, the new project, when carried out, will undoubtedly be the key to the Central African trade, so that the advantages to be derived from

this new field of commerce will extend far beyond the Northern Counties of England. In fact, the promoters seem to have the welfare of English commerce and manufacture generally at heart, as everything connected with the undertaking—the railways, &c., is to be supplied by the British. This is as it should be. In conclusion, we may say that the importance of this enterprise can hardly be over estimated, as it will tend to the completion of that splendid network of railways designed by British enterprise to carry the light of civilization and Christianity over the dark continent. Mr. Ferrar Fenton, of Batley (of the Anglo and Colonial Syndicate), has been appointed one of the directors of the Mapootaland Company, who have despatched the second expedition of surveyors, under the command of Colonel Wm. Jasser Coope and Mr. Ridley Henderson, of the firm of Henderson and Ball, civil engineers, of London, to complete the surveys and plans commenced by their first exploring expedition. We understand that the Colonial Office, before the sailing of the surveying staff, showed itself favourably disposed towards this enterprise, which will, doubtless, when it comes before the public, at an early date, receive that support which an undertaking, calculated, as this is, to be fraught with so much benefit to our English trade generally, deserves.

### Gristing Twisted Yarns.

To the Editors of the "Journal of Fabrics and Textile Industries."

GENTLEMEN,—I venture to bring before your notice, and that of your readers, a mode of finding the count, or, as we here in Scotland call it, the *grist* of twisted yarns. The usual way of finding the grist of two threads twisted together is to multiply the one by the other for a dividend, to add them together for a divisor, to proceed after this as in simple division, and the quotient is the grist or answer required. In this process, if it were wanted to find the grist of a 15 cut grist, and a 50 cut grist, when these were twisted together, you would multiply 50 by 15, producing 750, which, divided by 65 (the two grists added together), would give 11 36-65, or decimally 11·53. If it were desired to add another 50 cut grist to 11 35-65, it will be found to be a somewhat more difficult calculation, if absolute correctness were required. This method of finding the grist, or count of twisted yarns, I gave up about twenty-five years ago, having about that time discovered a better and far more easy way, and which I now proceed to set forth. When studying the nature and uses of logarithms, it occurred to me that an application of the principle of logarithms might be made for the gristing of twisted yarns, and, after some study, I made the following table.

Grist or Count.	Decimal Equivalent or Logarithm.	Grist or Count.	Decimal Equivalent or Logarithm.	Grist or Count.	Decimal Equivalent or Logarithm.
1	1·0000	16	0·625	40	0·250
1½	0·6666	17	0·588	41	0·244
2	0·5000	18	0·555	42	0·238
2½	0·4000	19	0·526	43	0·232
3	0·3333	20	0·500	44	0·227
3½	0·2857	21	0·476	45	0·222
4	0·2500	22	0·454	46	0·217
4½	0·2222	23	0·434	47	0·212
5	0·2000	24	0·416	48	0·208
5½	0·1818	25	0·400	49	0·204
6	0·1666	26	0·384	50	0·200
6½	0·1538	27	0·370	51	0·196
7	0·1428	28	0·357	52	0·192
7½	0·1333	29	0·344	53	0·188
8	0·1250	30	0·333	54	0·185
8½	0·1176	31	0·322	55	0·181
9	0·1111	32	0·312	56	0·178
9½	0·1052	33	0·303	57	0·175
10	0·1000	34	0·294	58	0·172
11	0·0909	35	0·285	59	0·169
12	0·0833	36	0·277	60	0·166
13	0·0769	37	0·270	61	0·164
14	0·0724	38	0·263	62	0·161
15	0·0666	39	0·256	63	0·160

In this table there are two columns. The first column shows grists or counts up to 63 cuts (or skeins), the second column shows the decimal equivalent, or logarithm of the grist. By adding any two or more of the decimals together, a number

or decimal is got which will approximate to a higher decimal, opposite which will be found the grist of the grists opposite the added decimals. Suppose it is wanted to know the grist of a 50 cut yarn and a 30 cut yarn, when twisted together,—opposite 30 will be found .0333, opposite 50 will be found .0200, which added together give .0533, the nearest number to which is .0526, opposite grist 19—the difference in this case between the size of the grist got and 19 being only seven ten-thousandths. In some cases, the difference will be more, as when the decimals of 15 cuts and 50 cuts, viz.:—0200 and .0666 are added, giving .0866, the nearest number to which is found to be .0833, opposite grist 12, giving a difference of thirty-three ten-thousandths. Again, if you wish to twist an 8 cut, a 30 cut, and a 50 cut together, you add the decimals opposite these grists, viz.:—1250, .0333, and .0200, obtaining .1783, the decimal nearest which will be found to be .1818, opposite grist 5½, the difference being thirty-five ten-thousandths between the decimal got, and that of grist 5½. If you wish to increase the number of grists with fractions as 5½ cut, or 6½ cut, multiply by 4, which, if you take 5½, will give 21. With this number divide 10,000, multiply the answer by 4, and you get the decimal equivalent, or logarithm of 5½, as .1904, of 6½ as .1600. In this way, you can increase the number of decimal equivalents, and have nearer approximations to the added numbers. If decimals are required for higher counts or grists, divide 10,000 by the grist, and the quotient is the decimal equivalent or logarithm. This system of gristing or finding the numerical size of twisted yarns can be applied to any count. It does not matter whether the yarns be skeins or cuts. Those whose business it is to grist twisted yarns will find that, by using this method of finding grists, they will save a great deal of time, besides approximating much nearer to the actual size of twisted yarns. I may mention that in August, 1872, I sent a letter on this subject to the *Border Advertiser*, Galashiels, in which the above points were set forth. It has frequently been suggested to me that I should give this mode of gristing twisted yarns a wide publicity, I, therefore, trust this will be suitable for your pages.

HAWICK, August 27th, 1888.

J. C. GOODFELLOW.

### Customs Tariffs.

NEW ZEALAND.—The following statement of the new Customs Duties proposed to be levied on articles imported into New Zealand, from the 30th May last, appears in the Board of Trade Journal, and was appended to the Financial Statement of the Colonial Treasurer, Sir H. Atkinson, to the Committee of Ways and Means on the 29th May:—

Articles.	Rates of Duty.
Blankets, rugs and shawls .. .. .	20 per cent. <i>ad val.</i>
Hosiery, woollen and mixed with wool .. .. .	20 " "
Woollen piece goods and piece goods containing wool .. .. .	20 " "
Cotton, linen, silk, and other textile piece goods .. .. .	20 " "
Cotton counterpanes .. .. .	20 " "
Cotton, linen, silk, and other textile manufactures .. .. .	20 " "
Holland, rough brown, not otherwise enumerated .. .. .	20 " "

The following additional articles are now free of duty:—Cotton piece goods and linen holland invoiced at, or under, 5d. per yard. Umbrella silk and other fabrics, when cut into pieces not larger than the size required for umbrellas, parasols, and sunshades, and to be specially used for such purposes. Also yarn, flax and hemp.

CANADA.—The following decisions affecting the classification of articles in the Customs Tariff of Canada have recently been given by the Canadian Customs authorities:—

Articles	Rates of Duty.
Alhambra coloured cotton quilts, colours woven	25 per cent. <i>ad val.</i>
Counterpanes or quilts, white, with woven coloured border .. .. .	25 " "
Lap dusters of cotton, with woven coloured stripes or borders, but not embroidered .. .. .	25 " "
Lap dusters entirely of linen, plain .. .. .	20 " "
Plant bed muslin, a low grade, unbleached cotton .. .. .	1 c. per sq. yd. and 15 per cent. <i>ad val.</i>
Lace collars .. .. .	30 " "
Cotton plush, coloured. This class of goods being distinct from velveteens and cotton velvets, are dutiable under item 117 .. .. .	25 " "
Window shade cloths .. .. .	5 c. per sq. yd. and 15 per cent. <i>ad val.</i>

UNITED STATES.—Embroidered and scalloped linen handkerchiefs, notwithstanding that they require certain portions to be cut off before reaching the condition in which such handkerchiefs are ordinarily used, or the fact that the embroidery constitutes the most prominent feature thereof, are held to be dutiable at the rate of 35 per cent. *ad valorem*, under the special provision in Schedule J (T. I., 334) for "handkerchiefs or other manufactures of flax, jute, or hemp, or of which flax, jute, or hemp, shall be the component material of 'chief value.'" Bookbinders' cloth, which consists of a cotton fabric largely impregnated with gum, so as to render it impracticable to determine the number of threads to the square inch without destroying the fabric, is held to be dutiable at the rate of 35 per cent. *ad valorem*, as an unenumerated manufacture of cotton.

MEXICO.—Bands of wool embroidered with cotton, duty, 3 dollars 50 cents per kilogram; of cotton tulle with woollen fringe, without embroidery, duty, 1 dollar 60 cents per kilogram; of cotton tulle, with woollen fringe, embroidered with cotton or wool, duty, 2 dollars 25 cents per kilogram; of animal hair cloth for machines, not imported with the latter, duty, 10 cents per kilogram; of hemp tissue, mixed with wool and animal hair, for machines, not imported with the latter, duty as above. Flags of woollen stuff, hemmed, duty, 5 dollars 50 cents per kilogram. Cords of hemp, covered with wool, duty, 2 dollars 80 cents per kilogram. Curtains of hemp, cotton, and wool, duty, 3 dollars per kilogram. Prepared sacks, common, of hemp, cotton, or any other material, as named in Category 30, Section 1, of the preliminary notes to the tariff (according to the description of the material). Shoddy, duty, 13 cents per kilogram. Carpets of hemp and animal hair, duty, 25 cents per square metre.

### Foreign Commercial Museums.

The *Schweizerisches Handelsamtsblatt* states that, although opened so recently as June 1886, the Milan Commercial Museum has already rendered important services to Italian industry. During 1887, a great deal of business was effected entirely through the museum, and the Italian Government is beginning to awaken to the value of this institution. It has lately shown this by an increase in the subsidy. The museum publishes a bulletin twice a month, describing all specimens received since the last publication, and adding all such facts and general information as can be deemed important in the interests of Italian export trade. The *Receuil Consulaire Belge* says that the Commercial Museum opened at Oporto, on the 21st of March of last year, has proved a great success. It contains very numerous specimens of all the small domestic trades of Portugal. From January to April of the present year, 8,251 persons visited it. Most of the articles exhibited are Portuguese, for very few foreign manufacturers have made any response to the invitation to send their products to the Oporto Museum. The *French Journal Official*, for the 25th July last, states that, according to the annual report of the Frankfort Chamber of Commerce, 6,586 persons visited the Commercial Museum in that town during 1887. The condition of the museum is in every way satisfactory, and its collections are being rapidly added to. According to the *French Journal Official* for the 12th July last, the Belgian Consul-General at Buda-Pesth reports very favourably of the usefulness of the Commercial Museum of Buda-Pesth. This museum has been established by the Austro-Hungarian Ministry of Commerce, and its budget is covered by a subsidy from the Government, augmented by contributions from the Chamber of Commerce, from the Austrian Lloyds, and from various societies. The object of the Buda-Pesth Museum is not, like that of Brussels, to show to producers specimens of the articles in demand in foreign markets, but solely to exhibit whatever is manufactured in Hungary, and thus to place the Hungarian nation in a position to know what its own products consist of. It is not merely an exhibition, but a vast market as well, and it occupies the large spaces engaged for the Pesth Exhibition of 1885. The only articles excluded are those which are excessively cumbersome or dangerous, as locomotives on the one hand, and explosives on the other.



## ORIGINAL DESIGNS.

On our first plate, we give a design for a Brussels Carpet with Border. This is intended to be produced as a five frame, three-quarter body, and three eighth border, and would look well with a green-drab ground, the ornament in cream, brown, Indian red, and dark maroon shaded to black. For a change of colouring—blue might take the place of Indian red, and the ground could be in silver grey.

Our second plate shows a design for a Linen Table Cover.

Our third design is intended as a suggestion for the centre of a Silk Handkerchief. These designs have been drawn by Mr. R. T. Lord, 10, Ann Place, Bradford.



## MONTHLY TRADE REPORTS.

**Wool.**—There has been a fair demand for wools for consumption, but without much speculation, spinners buying generally for actual requirements. This applies both to English and Colonial wools. Prices, on the whole, have been well maintained. Orders for yarns have been freely offered, but, generally, for small quantities of various qualities, both for the home and foreign trades. An improved demand has been experienced for two-fold yarns, and also for those of a fancy character. Some admirable yarns in the latter class are now being produced, especially for the mantle and coating, &c., trades. The piece branches have not varied much from last month; buyers have generally operated cautiously, and have given orders in small quantities. The American demand has been satisfactory, and, judging by reports, seems likely to be good for some little time.

**Woollen.**—The unseasonable weather has again had a bad effect on this branch of industry, stocks in the hands of merchants being much heavier than is usual at this time of the year. This fact has caused them to act very cautiously in ordering new goods. In nearly all branches, with, perhaps, the exception of fine fancy worsted, production has been curtailed, and, in many districts, short time is being run. This is notably the case amongst manufacturers of the cheaper classes of tweeds, who, for some time past, have had a fairly good business. Hopes are entertained of a revival of trade, should the weather take a more favourable turn. Manufacturers of fine worsteds are at present producing some novel effects in their fabrics in varied designs and colours. Makers of tweeds are also to the front with the variety of their productions, in which fancy yarns are a predominant feature. Prices generally of all descriptions of cloths show but slight variation.

**Linen.**—Trade in the linen district has exhibited a fair amount of activity, and the demand for most classes of goods has equalled production. Jute yarns and goods have met with an improved inquiry, and orders have been booked at rather higher rates. The outlook is very cheerful. In flax, there has been a falling off in the demand, owing to the extreme rates generally asked. Consumers are more or less supplied, and are indisposed to enter into any new engagements at the prices generally demanded.

**Lace.**—The lace trade still keeps quiet, and is devoid of animation in nearly all departments. Novelties have recently been few, as those lately put before buyers have met with but slight demand. The curtain branch has ruled rather quieter, many frames having been idle during the month. Both plain cotton and bobbin nets have experienced a slow sale, and the same may be said of nets generally. Millinery laces, of which

the supply has been large, have accumulated, and makers of these are despondent in consequence. Chantilly laces have sold fairly well, as have also Valenciennes. Prices, which are generally at a low ebb, have shown but a slight difference from last month.

**Cotton.**—The sales of raw material have been about the average, and the same may be said of yarns and cloth. For India, Japan and China, fair orders have been booked, at firm rates, inquiries for these countries having been numerous. Spinners of yarns suited to the countries in the East have orders for some weeks to come. The demand for the home trade has fallen off slightly, as buyers offer prices which producers fail to see their way to accept. The export trade in cloth has been steady, the demand for the East having been fairly good, with prospects of further improvement. The Continental demand has been about an average one. The home branches have, with the exception of the heavier makes of cloth, been fair, but merchants offer such low rates that business has been retarded in consequence.

## A New Silk Dyestuff.

The "Badische Anilin und Soda Fabrik," in Stuttgart, has recently introduced, under the name of "rhodamine," a dyestuff which gives upon wool and silk very pure and highly fluorescent rose shades. It is claimed to be superior to rose bengale and phloxine, which are nearly of the same tone, not only by very good resistance to light, even in the lightest shades, but upon wool by fastness against pretty strong fulling. The dyestuff is readily soluble in water. Wool is dyed with it at a boil, either upon a neutral bath, or upon an acid bath with glaubersalt and sulphuric acid. Silk is also dyed either without any addition, or upon an acid bath, or upon a bath of broken soda; a feebly acid solution facilitates dyeing up. The dyestuff runs up but slowly, giving very level dyes; the baths are not exhausted, and can be preserved for further use. Rhodamine can also be dyed upon cotton, with acetate of alumina, or upon a tannin and tartar emetic mordant; but is not particularly fast upon cotton fibre. Yet it is superior to rose bengale and phloxine, and about as fast as safflower carmine.—*Farb. Must. Zeitung.*

## Alizarine Steam Red for Handkerchiefs.

These reds and pinks have usually been printed upon cloth prepared with Turkey red oil. This process is expensive; it also often decreases the beauty of other colours when they are printed at the same time as the red, as is the case with handkerchiefs, etc. The following receipt is recommended, and allows the printing of other colours. The receipt given is for a red:—Alizarine, 15 per cent paste, 200 parts. Thickening, starch, etc., 280 parts. Acetate of lime, 74° B, 68 parts. Sulphocyanide of alumina, 20° B, 60 parts. Turkey red oil, 50 per cent, 50 parts. Acid preparation, 72 parts. A second receipt for pinks is as follows:—Alizarine, 20 per cent, 187 parts. Acetate of lime, 170 parts. Thickening, 3,500 parts. Sulphocyanide of alumina, 150 parts. Turkey red oil, 75 parts. Acid preparation, 100 parts. The acid preparation is composed of one quart of acetic acid of 8° B, and one-third ounce of tartaric acid crystals. When working on a large scale, some precautions are necessary. The acid used is so strong that the machine must be washed frequently. Finally, care must be taken not to grease the cloth during the steaming. To accomplish this, it is rolled up with great care, afterwards completely unwound but not piled up, and washed with plenty of water. It is not necessary to soap, but soaping brightens the shades, particularly if a little soda and tin salts are added to the bath.—*Bruehl.*

## Commercial Failures.

According to *Kemp's Mercantile Gazette*, the number of failures in England and Wales gazetted during the four weeks ending Saturday, August 25th, was 357. The number in the corresponding four weeks of last year was 378, showing a decrease of 21, being a net increase in 1888, to date, of 20. In addition to these gazetted failures, there were 250 Deeds of Arrangement filed at the Bills of Sale Office during the same four weeks, making a total in 1888, to date, of 2,256. The number of Bills of Sale published in England and Wales for the four weeks ending Saturday, August 25th, was 862. The number in the corresponding four weeks of last year was 945, showing a decrease of 83, being a net decrease in 1888, to date, of 541. The number published in Ireland for the same four weeks was 32. The number in the corresponding four weeks of last year was 42, showing a decrease of 10, being a net decrease in 1888, to date, of 125.

# The Journal of Fabrics and Textile Industries.

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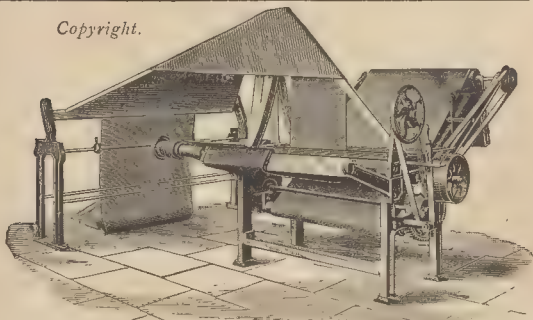
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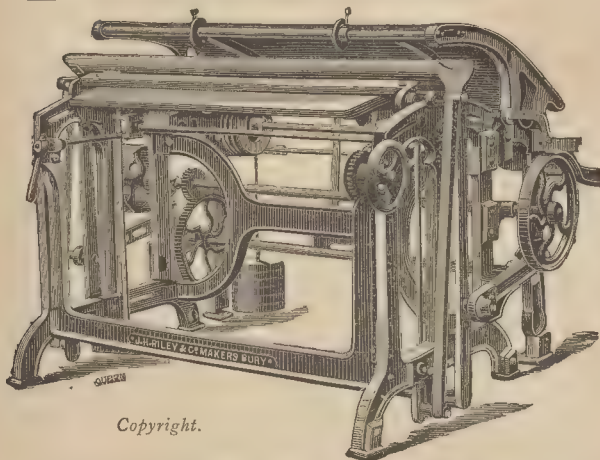
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large number of machines at work.



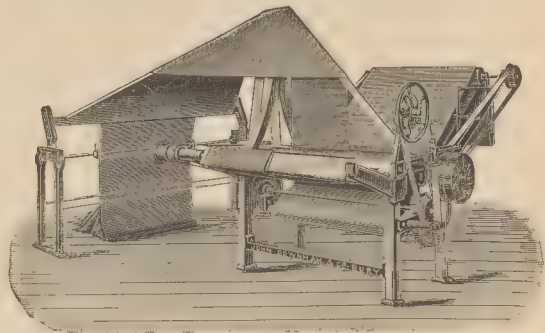
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We have some scores of these machines at work.

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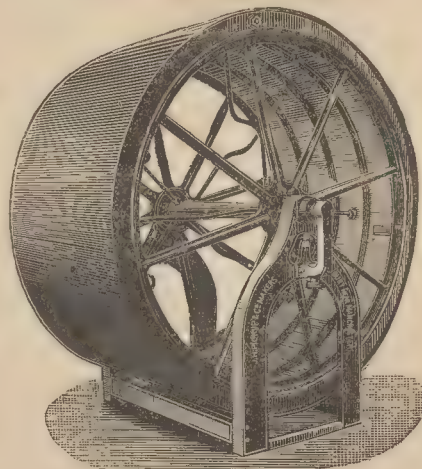
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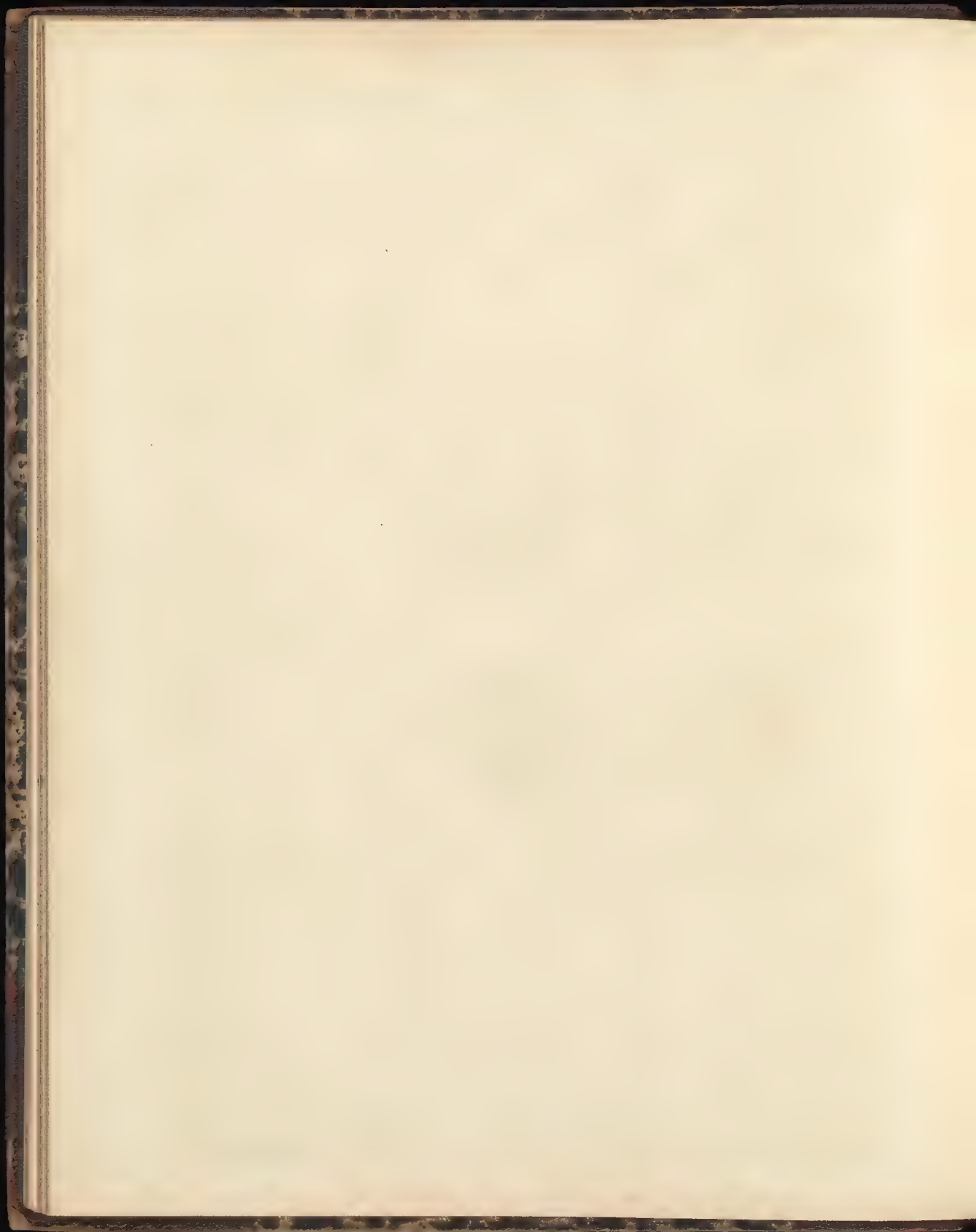
We have made a  
speciality in Tin  
Rollers, knowing  
the importance of  
Machinists and  
Mill Owners hav-  
ing a good and  
true Roller to run  
the speeds that  
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LINEN TABLE COVER.

2nd SEPTEMBER 1888



SILK HANDKERCHIEF

## FASHIONABLE \* DESIGNS.

The designs given below are our first selection for the autumn and winter seasons of 1889 and 1890. The latest French patterns for these seasons show some good effects. As in former seasons, we can offer selections of these styles in worsteds, tweeds, chevots, &c., &c., at £2 per hundred. Those requiring these patterns should make an early application, accompanied by cheque or post-office order for that amount.

## Mantle Cloth.



No. 544.  
Warp:—11 ends Black woollen 2/20's.  
1 end Black mohair.  
Woven:—12 picks Black woollen 2/20's.  
1 pick Black mohair.

The x indicates 1 end and 1 pick of mohair.

1,536 ends in warp; 24 ends per inch;  
22 picks per inch; 8 healds; 6's slay; 4  
ends in a reed; 64 inches wide in the loom;  
56 inches wide when finished.

Straight draft. Weight about 20 ozs.

## Fancy Trousering.



No. 545.



Design.

Draft.

Ends marked thus x in Draft are mohair.

Warp:—14 ends 2/20's Black.

6 " 1/20's Black, twisted to 1/20's Olive.  
2 " 1/20's Black, " 1/20's Stained.  
2 " Black mohair.

Woven:—All Claret 2/20's.

1,920 ends in warp; 30 ends per inch; 26 picks per inch;  
6 healds; 11½ slay; 3, 3, 3, 3, 3, 3, 2, 1; 64 inches wide in  
the loom; 56 inches wide when finished; clear finish.  
Weight 24 ozs.

## Woollen Trousering.



No. 546. Warp:—1 end Fancy twist.  
7 ends Black 22 skeins, twisted to Olive,  
22 skeins.  
4 " Black 12 skeins.

Woven:—All Black weft, 12 skeins.

Straight draft.

1,920 ends in warp; 30 ends per inch; 28 picks per inch;  
8 healds; 7½ slay; 4 ends in a reed; 64 inches wide in the loom;  
56 inches wide when finished; clear finish. Weight about 20 ozs.

## Woollen Suiting or Ulster Cloth.



No. 547. Warp:—1 end Light Blue, 11 skeins.  
6 ends Brown, "  
1 end Light Blue, "  
8 ends Black, "  
4 " Tan, "  
3 " Brown, "  
1 end Light Blue, "  
8 ends Black, "

Straight Draft.

32 Woven as warped.

1,920 ends in warp; 30 ends per inch; 27 picks per inch;  
8 healds; 7½ slay; 4 ends in a reed; 64 inches wide in the loom;  
56 inches wide when finished; soft finish. Weight about 22 ozs.

## Action of Light on Coloured Fabrics.

In most cases the action of light results in discolouration, but during this action it causes a change in shade. Thus skeins dyed with picric acid pass from light yellow into a yellowish orange; those dyed with fuchsine into dull shades approaching violet. Certain colouring matters resist the action of light better than others. Thus, shades produced with alizarine do not change, while those obtained with eosine disappear almost entirely. It depends upon the nature of the substance. On the other hand, when a great quantity of the colouring matter is incorporated in the tissue, the resistance to light is naturally greater. It was thought that in the cases of fibres requiring a mordant, the fastness of the shade could be increased by choosing among the mordants which could possibly be used, those which furnished the greatest resistance to light. It is conceivable that after the mordant has combined with the colour, certain of these combinations would have a greater resistance than others. Thus, for example, the combination of fuchsine with tannin would be faster than that with alumina or the sulpholeates. But, as a matter of fact, very slight differences only have been observed; nothing of general application. It is easy to understand, considering the combinations of the colouring matter with alumina, tannin and the sulpholeates, that, while they are different, they are yet analogous, and it is nothing astonishing that they should have like properties, and nearly an equal resistance to light. In dyeing with aniline colours, either sulphate of soda or common salt is often employed to render the dyeing slower or more uniform. It would be expected that the resistance to light would be equally increased, and, in fact, the difference in results is hardly appreciable. These negative results would indicate that the only way to better the resistance of dyed work done with fugitive colours would be to incorporate as much colour as possible in the tissue, that is to say, to saturate it. But, in reality, that does not answer the purpose on account of the necessity for producing light shades, because of the price, and, finally, it is limited by the amount the fibre will take up. This incorporation has a wider limit in the cases of colours precipitated, as indigo, aniline black, &c., and is one of the causes of the great fastness of these colours. The colouring matter, in many of these cases, is very stable itself. The method of testing fastness to light is very simple; a part of the skein is exposed to the sun, a part is covered by a screen, and the shades are compared. It is necessary to take proper precautions, unless the tests are to give erroneous results. The double cause for fastness of colours, the quantity incorporated, and the nature of the colour, has often introduced confusion into the tests made by technical men. Thus, by using skeins coloured by a fugitive colour, where the fibres were saturated, it has been wrongly concluded that these colours had some fastness. Further, if shades made with such colouring matters are compared in fastness with a typical colour, care must be taken that the same weight of colour is present upon each test, and that the shades are light, so that a slight effect can be perceived. It is equally essential that they should be exposed in the sun together, for not only does the intensity of sun-light differ at different times, but the condition of the atmosphere at the time of the test can have an influence. This can be shown by a striking experiment. Expose to the action of the sun two pieces of coloured material. Place one in a bottle containing chloride of calcium to make the air perfectly dry, and place the other in a bottle with a small quantity of water so that the air may be moist. It will be seen that the piece in moist air is bleached much more rapidly than that in dry air. Moisture renders the action of light much more rapid. This circumstance explains the fact that has been known for a long time that on the coast goods lose colour much more rapidly than in the interior. This is because, in the interior, when the sun shines, the air is usually dry, while, on the coast, even, when the sun shines, the air is always moist on account of the nearness of water. Therefore, on the coast, the conditions are like those in the second bottle, and we have the action of light in moist air, and the fading takes place more rapidly.—Jules Joffre, in the Bulletin de la Société Chimique.

# MACHINERY, &C.

## Holden and Ishworth's Patent Stop Motion Twisting Machine.

The attention of yarn doublers is especially called to the special patent stop motion twisting machine, which has been invented by Messrs. Holden and Co., machinists, Manchester. This firm have already in the market

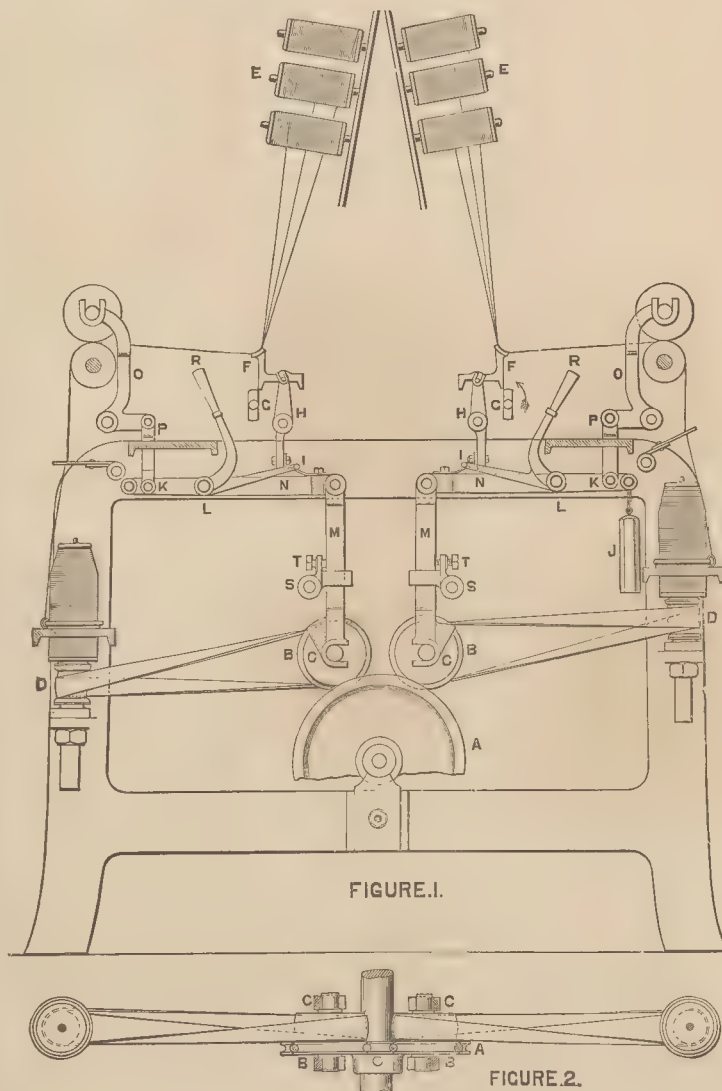
several special machines for this class of work, attention to which has been called in previous articles in our pages. These machines are made for all classes of silk, cotton, woollen, jute, hemp and flax, and are made to twist both heavy and light yarns. The above are all fitted with a separate stop motion to each spindle, which stops spindle and corresponding roller the instant any single end breaks behind the roller, thus preventing waste and bunch knots. In each of the above machines, Messrs. Holden and Co. have secured by their patent clutch a positive driving, which, by its special construction, allows the spindle to be run at a very high speed. But their latest invention is one that enables them to run at a much higher speed than hitherto, as it is applied to the rabbeth spindle, and can be run at as high a speed as this class of spindle is capable of being run, namely, from 6,000 to 10,000 revolutions. The invention has been the result of much careful study, and practical experience, as to the wants of this branch of trade. Each spindle is driven by friction, which is very quick, positive, and noiseless in its action in starting and stopping. The advantages secured over some other machines of its class are shewn in the accompanying illustration, to which we draw attention. Fig. 1 is an end view, showing the action of the working parts. Fig. 2 is a plan showing the way the spindles are driven. It will be seen that the driving is obtained by tapes  $\frac{1}{2}$  inch wide, but the machines are made to drive by either the ordinary band or belt, and are now being made by the above firm for rabbeth bobbins ranging from 5 by 2 to 6 by 4; also for flyer bobbins up to 6 by 4. On Fig. 1, A

represents the driving pulleys, which are fixed on the driving shaft, each of which pulleys drives two spindles, one on each side of the frame. These pulleys are grooved on the top. B in Fig. 1 and B in Fig. 2 are two smaller grooved pulleys, in which groove is secured a ring of rubber. Attached to this grooved pulley is a pulley C, around which the belt runs on to the spindles D and D. Thus it will be seen when the surface of the small pulley B is pressed into the groove of the large pulley, it gives motion to the spindle, and when the pulley is lifted, it instantly stops the spindle. One feature specially noticeable is that when the spindle is stopped the band is stopped, so that there is no wearing of loose parts of a warve. E is

the bobbins in the creel, which can be increased up to six. When any single end breaks, or bobbin runs empty, the thread guide F immediately falls, there being one of these guides to each thread. In the ordinary yarn doublers, the common drop wire is used, but for soft hosiery yarns, the drop guide as shewn is adopted, as it does not ruffle or rob the yarn of the loose fibre which should be secured in the twist. The action of falling brings it in contact with the wiper shaft G, which knocks the lever H backward, liberating the catch at I, allowing the weight J to pull down the end of the lever, which lever works on the fulcrum L, thus lifting the rod M, the bottom of which carries pulleys previously named out of contact with the driving pulley A, thus stopping the spindle and pulley B and C. The lever K is held down at I, and pressed

on to the pulley by means of spring N. The lever K, which is attached to the top roller, carries O by means of link P, in its downward action pulls the top roller back from the bottom roller by the same action that releases the pulley B from A, instantly stopping the spindle and top roller. When the attendant has pieced the end, the lever is pushed backwards at R, when the lever H falls forward, and locks itself again at I, allowing the spindle and roller to start instantly. On two shafts, marked S and S, are fitted slot brackets guiding the lever M, in which is a screw T, and by means of this the band may be tightened. There is also a front stop motion, acting when the twisted thread breaks between the front roller and spindle. The advantages of this machine will be seen at a glance in securing an instantaneous start and stop, and also in being enabled to run at a very high speed, and, further, it can be driven by either band or cord, and can be applied to either ring or flyer spindle. In ordinary cop winding frames, it is never considered advisable to wind from above 6 ends, and when 12 ends are required to be wound together, it has always been necessary to have a second winding, in order to prepare a strand of 12 ends for the twisting frame. This, we find, has been overcome in this special machine, and also in their new patented winding frame, by an arrangement by means of which they get twice as many ends as have ever before been considered practical in winding or twisting frames (in winding from cops or winding frames, or stop motion twisting frames), and for which arrangement they have taken out a special patent. Messrs. Holden and Co. have every confidence in recommending this machine, and are

sure it will give universal satisfaction wherever it is adopted. It may be seen in operation at their works, Carr Street, Blackfriars Street, Manchester, where their various machines are in motion. Thus, those desirous of purchasing machines of the class here mentioned have the advantage of being able to see them in practical operation, and of judging of their suitability for the purpose required, before placing their orders. The various special machines which this firm make for doubling, winding, and twisting, shew, unmistakably, that they are a firm who are always on the look out for improvements, thus enabling them to keep pace with the ever increasing requirements of the trade for the most efficient machinery.

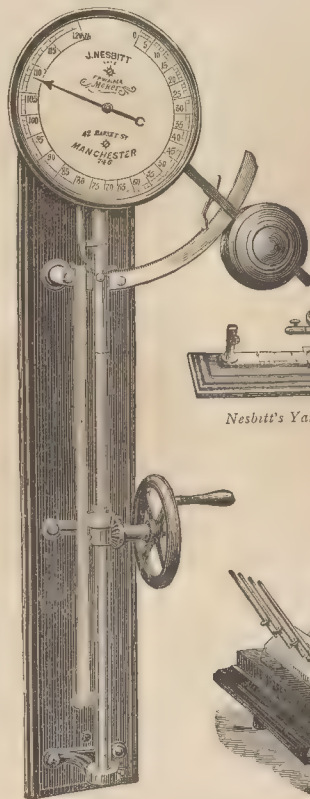


### Yarn Testing Machinery.

It is of importance to spinners and manufacturers that the best yarn testing machinery and appliances obtainable should be in their possession, and, therefore, no apology is needed in bringing before the attention of our readers the various machines manufactured by Mr. John Nesbitt, 42, Market Street, Manchester. We may state, as a matter of interest, that the business, of which Mr. Nesbitt is the head, was established over a century ago by the late Mr. Francis P. Walker, who, we believe, was the original patentee of the yarn testing machine. It is, therefore, only reasonable to suppose that the long experience brought to bear upon the varied requirements of efficient testing machinery has resulted in the best improvements and workmanship being applied thereto. The machines to which we shall devote a few remarks are a vertical lever yarn tester, a hank quadrant, a yarn twist testing machine, and a wrap reel. The Vertical Yarn Tester is used for testing the strength and elasticity of cotton, woollen, worsted, or silk yarn. It will show, with the utmost exactness, the breaking strain of from 1 lea or 1 hank to 130 lbs. of yarn. It contains all the latest improvements, is handsomely mounted, and the best workmanship is visible in every particular. The Hank Quadrant ascertains, to a nicety, the weight of a lea of yarn. It is fitted with a turned, lacquered and polished brass pillar; engraved and silvered quadrant on iron stand, best hardened steel centres, and brass lock nuts. This instrument indicates the counts or numbers of hanks of yarn per pound. The hank is placed on the small hook which is connected with the indicator, the weight of the yarn causing the indicator to travel up the index or quadrant, showing at once the exact counts or number of hanks to the pound. This instrument

takes the place of scales, weights, and yarn list, and will be found most useful and profitable to all traders in yarns. With regard to the third of these, viz., the Yarn Twist Testing Machine—we shall say little. Its purpose is, as is generally understood, for ascertaining the number of twists per inch in every description of yarn, and the appliance under notice is arranged to test from a quarter of an inch up to twelve inches. The last to claim our notice is a Wrap Reel for ascertaining the length of cotton, silk, or woollen yarns, from cops or bobbins. The machine is fitted on French polished baywood stand, with double self-acting spreading motion, elaborately finished iron pillars and shaft; fancy brass arms and wheels, polished and lacquered. It is fitted with dial and striking apparatus, which records every 120 yards wound. By the arrangement of this reel, the cops or bobbins travel with the spreading motion, by which the threads are controlled and guided directly opposite to the glass eye-piece, thereby securing an equal distribution in the motion, which ensures the exact length being wound off the cop or bobbin. Other wrap reels are made, and can be had to suit the different requirements of the trade. These vary in price, from £4 to £7 10s., the latter being represented by the illustration we give. There are numerous other machines and appliances manufactured by Mr. Nesbitt, which we may here briefly notice.

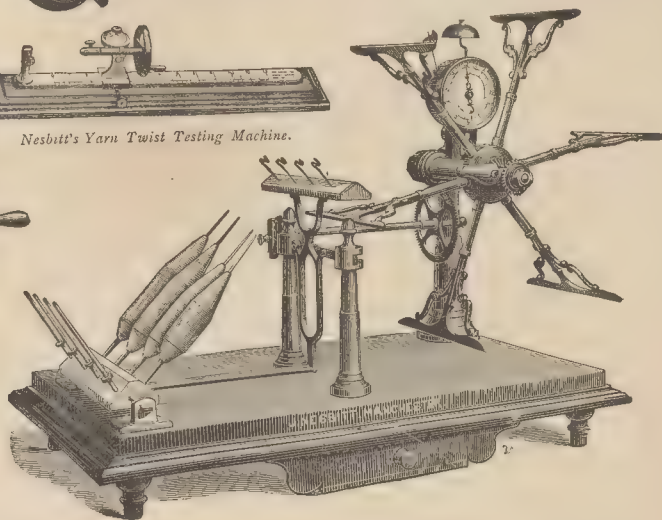
These include testing machines for showing the tension or breaking point of cloth, canvas, &c., testers for single threads, horizontal testers, fitted with Salter's spring balance, and also cloth scales in various sizes; roving and slubbing reels, bundling presses, spindle speed indicators, bundling and knotting hooks, weft winders, and others too numerous to mention. Those of our readers requiring any of the machines or appliances here named should communicate with Mr. Nesbitt, who will be pleased to give the fullest information regarding them, and will also forward catalogues of his manufactures, which, we may add, include almost every class of mechanism for special and general use. The whole of them are made from the best materials, and the workmanship is of a very high order. We have every confidence in recommending this firm to the notice of our readers, who should send for, and keep, Mr. Nesbitt's catalogues by them.



Nesbitt's Vertical Lever Yarn Tester.



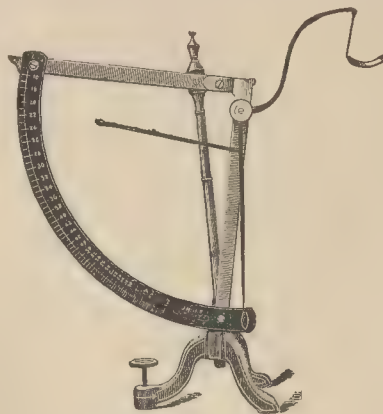
Nesbitt's Yarn Twist Testing Machine.



Nesbitt's Wrap Reel.

### A New Rug Loom.

An American contemporary says:—We desire to call the attention of our readers to the rug loom, manufactured by the Gilbert Loom Works, Worcester, Mass., for the weaving of rugs, tapestries, stair carpets, etc. This loom is of the style known as the hand-loom, but differs from the ordinary hand-loom in that it has no lay, the woof being beaten in by hand with a comb. The designs that can be woven on them are unlimited, any



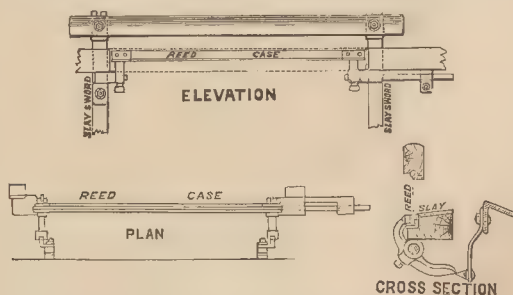
Nesbitt's Hank Quadrant.

pattern, either in pile, tufted or flat goods, that can be woven on the most complete jacquard loom, is readily re-produced on this loom. It is made of wood, and is stained or finished in natural colours, and takes up but little floor space. The principle of this loom is similar to the famous low-warped goblin looms, which are owned by the French Government, and patterns

that are woven on those looms can be readily copied on these. These looms are not only designed for hospitals and prisons, but for the home as well, as they will make quite an attractive addition to the household furniture. Ladies, and even children, can readily be taught to weave on them, so that every housewife can make and design her own rugs, tapestries, etc., the process being very pleasing as the work progresses and the patterns are brought out. There have been two of these looms in use for about two years at the State Lunatic Hospital, of Worcester, which are very highly spoken of by the Superintendent, Dr. John G. Park, M.D. This rug loom has not yet been put on the market, but will be manufactured and sold at \$40.00 each, including a design and instructions how to put in the warps,—short warps can be used in them.

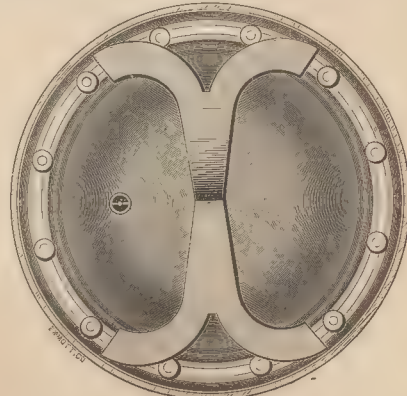
### An Improved Reed Case for Loose Reed Looms.

In the construction of loose reeds, there have been many new devices patented, the object being to make them more efficient, with as little complication in the mechanism as possible. An improved reed case has been recently invented by Mr. C. Turner, of Folds Works, Rawtenstall, near Manchester, which, for simplicity of mechanism, and the ease with which it can be fixed and adapted to either new or old looms, irrespective of construction, should make its mark amongst users of this class of apparatus. The object of the inventor has been, to simplify, as far as possible, the arrangements of the "reed case" and "stop rod," so that, during the locking action, the reed case will be enabled to close up to the reed with greater efficiency, regularity, and uniformity than in mechanisms now in general use, and the apparatus has been designed in such a manner that the loose reed attains greater firmness, and each pick of weft is given with regularity, so that it is on a par with a fast reed. Mr. Turner guarantees that for sim-



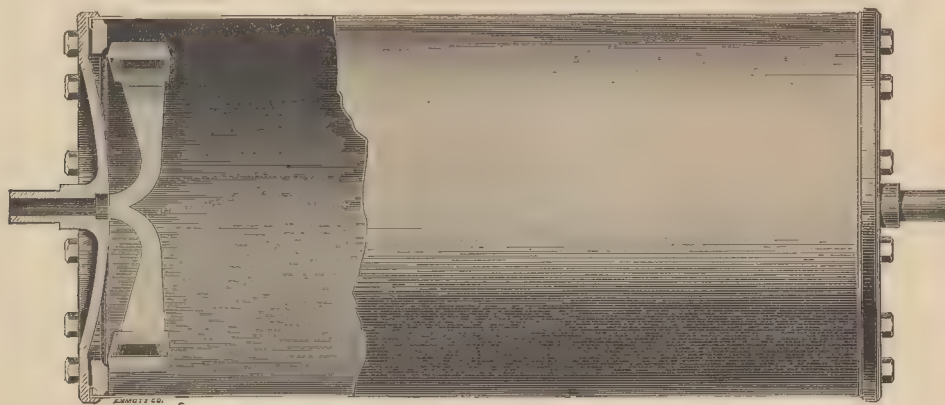
plicity and strength, combined with lightness, his improvement excels those in general use, the reed being so firmly held that the weft is driven equally well home in the middle as at the sides, thereby making the cloth look far better than when woven by any other arrangement, and enabling any strength of cloth to be woven in a loose reed loom, and that the saving in power alone in a shed where this is attached is very great where it replaces the fast reed, as there is no necessity to load the chisels with springs to make them catch the frogs, and, consequently, rendering the shuttles harder to drive in and out of the shuttle box, and bringing more strain on the whole of the shuttle driving motion, and that, as a lesser strain is brought on the loom where this motion is used than in the fast reed, a great reduction of breakages of wheels, slay-swords, swing-rails, frogs, etc., is effected. In the weaving of light weight goods, it ought to be of especial advantage.

partly in section. The ends are cast in iron, in the form generally in use, except that the flange is on the outside of the shell instead of the inside. A cast iron ring, turned and faced to fit the inner circumference of the shell, and of the required strength, is fixed in such a position as to receive the flange thrown off the shell. The ring is drilled at the required distances, and is tapped, the end also undergoes the former process. They are then secured in position by set screws, and being tightened, a perfectly steam-tight joint results. The ends are easily removed by any workman, and replaced without difficulty, so that, should it be necessary at any time to examine the inside of the cylinder, or in any manner to make repairs, this may be done without the assistance of a tinsmith, who would be required in the case of an ordinary cylinder under similar circumstances. We are informed that all cylinders made upon this improved principle are



An Improved Drying Machine Cylinder. FIG. 1.

tested under a steam pressure of 60 lbs. to the square inch. We have no doubt that users of drying machine cylinders will readily admit that the patented method under notice is a great improvement over that in general use. Another improvement registered by Mr. Lang Bridge relates to cast iron buckets. This improvement has been found very successful, as the buckets can easily be attached to the ends of the improved drying cylinder. This desirable result is obtained by casting the inner ring of the cylinder and the buckets all in one piece, and thus the latter are secured when the end is put in, and tightened with the set screws. It is scarcely necessary to



An Improved Drying Machine Cylinder. FIG. 2.

### An Improved Drying Machine Cylinder.

An improved, efficient, and simple, method of securing the ends of drying machine cylinders has been patented by Mr. Lang Bridge, Accrington. Much expense is entailed in the repairing of drying machine cylinders through their liability to get out of order from obvious causes too numerous to mention. Such cases necessitate the removal of the cylinder, thus causing the stoppage of the machine, and annoyance and loss to the user. The method employed by Mr. Lang Bridge, illustrated in Figs. 1 and 2, secures a perfectly steam tight joint without the use of solder, whereby a much higher pressure may be obtained than is the case with the ordinary soldered joint. At the same time, the liability to breakage is reduced to a minimum. From a reference to the illustrations, the improvements will be easily understood. Fig. 1 is an end view in section, Fig. 2 a front view,

say that the buckets cannot come loose. The advantages claimed for these buckets are—firstly, their non-liability to get out of order, having no joints or loose parts; secondly, they are double acting, thus discharging the condensed steam in whichever direction the cylinder turns; thirdly, being of cast iron, they will last as long as the cylinder itself. A comparison of the methods in use in the case of ordinary cylinders and buckets, and those of the improved ones, will certainly result in a decided preference being awarded the latter, for, whereas, in the former, soldering and rivetting the buckets to the shell of the cylinder, and soldering the ends in position, must be resorted to, in the latter, the most simple and efficient means are employed, resulting in the greatest strength and durability being obtained. Also a higher pressure of steam is obtained, and, therefore, the drying power is increased. Repairs are reduced to a minimum, and as to the first cost of the cylinder, we are informed that if there be any increase over that of ordinary cylinders, it is so slight as to be almost unnoticeable.

### Patent Corrugated Sliver Cans.

The patent corrugated circular carding or sliver cans, manufactured by Mr. Lang Bridge, Accrington, are well worth the attention of users of such apparatus. That corrugating articles of metal imparts considerably greater strength where lightness is an object has been abundantly proved, and, therefore, its application to the purpose under notice is one which gives the very best results.

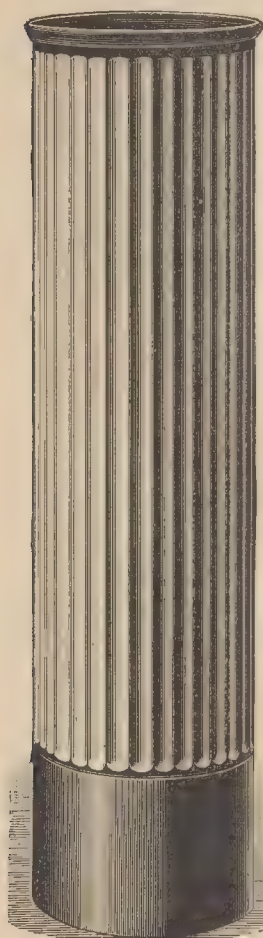


FIG. 1.

Fig. 1 is an illustration of the sliver can, from which it will be noticed that it is fluted or corrugated from about half an inch from the top ring to within about an eighth of an inch from the binder. It is a well-known fact that the ordinary can is weakest two or three inches above the binder, where, to use a well-known phrase, it telescopes, this being the result of the amount of hard usage it undergoes in falling heavily upon the floor. Much expense is entailed in repairing cans, particularly at the point indicated, and to obviate this the can under notice has been invented. The weakest part in other cans, in this becomes the strongest, as, being so near the end of the corrugation, it receives additional strength thereby. Where extraordinarily strong bottoms are required to sliver cans, an improved steel bottom has been invented, which is shown in Fig. 2.

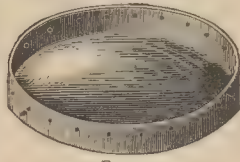


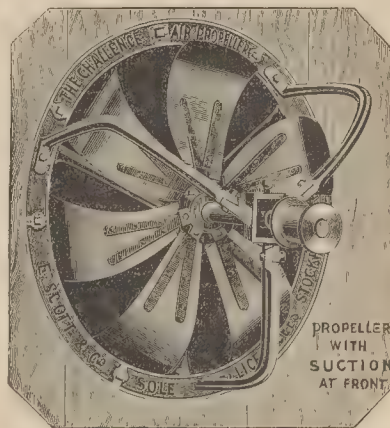
FIG. 2.

and which, we are informed, is practically everlasting. This bottom can be applied to the ordinary plain can, as well as to the corrugated can. The maker affirms that the strength of his patent sliver can is three times that of ordinary cans, and that, since this improvement was brought out, the sale of the former has been very large indeed, and is daily increasing. This firm have two branches in their business: one in which almost every kind of article of tin, copper, or brass, for the textile manufactures, is made—from the smallest oil can to the largest drying cylinder, including machinery for size mixing and heald varnishing. This department of the business, we believe, is by far the largest of its kind in the trade, and its productions are sent to every part of the globe where the textile industries are known. In the other branch of the business, all kinds of machinery are made for bleachers, calico and woollen printers, dyers, &c., and in this department many important improvements have, from time to time, been introduced. This improvement, and also that in the method of making the small drying cylinders for finishers, printers, and others, to which we refer in preceding notice, are, we feel sure, worth the attention of all who may need this class of goods.

### The "Challenge" Reversible Air Propellers.

In previous issues of the Journal, descriptions of the mechanism of various makes of air propellers have been given, and the advantages claimed by the makers of this class of apparatus have been put before our readers. The "Challenge" Propeller, which is being made by Messrs. Scott and Co., of Brinnington, Stockport, is one of the latest appliances, and this firm claim to have made many improvements upon the older types. This propeller is adaptable for the movement of air, dust, steam, &c., in large or small volume. The blades follow an elliptical curve, at about half their distance from the centre, and this form of blade enables them to get a firm grip upon the air, dust, &c., to be removed. The blades are adjustable, so that the draft can be regulated, or changed in direction. The bearings are at one side in one variety (it is made in two varieties), and any lubrication can be done when the propeller is running. The back draught is reduced to a minimum, as the size of the delivery is greater than the feed.

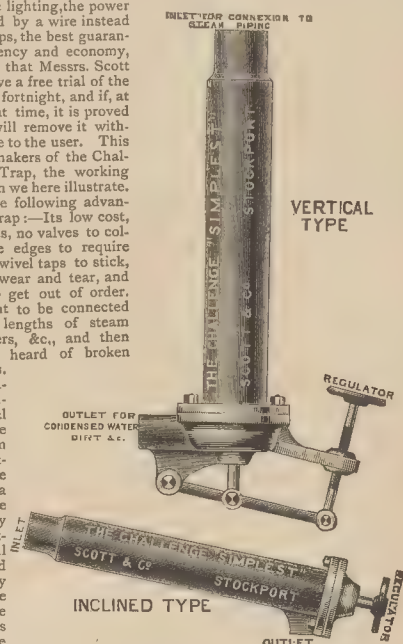
The mechanism of the propeller can be seen from the annexed illustration. It is specially adapted for removing steam and humid air from dye, silk, and such like works; dust from carding, flax, calico printing, and other mills; and for drying purposes in the textile trades it will be found invaluable. In positions where there is no available engine power, but where



there is steam power, and for running in the night time, when the large engine is at rest, a steam direct driven propeller can be fixed by this firm, which is specially adapted for drying and ventilating purposes. They also supply propellers fitted up with a water motor, which can be driven cheaply, and also others for direct driving by electricity, with motor wound to suit dynamos

used for electric lighting, the power being conveyed by a wire instead of a belt. Perhaps, the best guarantee of its efficiency and economy, lies in the fact that Messrs. Scott and Co. will give a free trial of the propeller for a fortnight, and if, at the end of that time, it is proved useless, they will remove it without any expense to the user. This firm are also makers of the Challenge Steam Trap, the working portion of which we here illustrate. They claim the following advantages for this trap:—Its low cost, no moving parts, no valves to collapse, no knife edges to require renewing, no swivel taps to stick, a minimum of wear and tear, and non-liability to get out of order. The traps ought to be connected with all long lengths of steam piping, cylinders, &c., and then less would be heard of broken joints, and pipes.

They also manufacture the Challenge Centrifugal pumps. These are made from entirely new patterns, and are the result of a large experience in them. They have them working under all conditions, and they give every satisfaction. The makers will give to buyers names of firms where these pumps are working. A point worthy of notice in these pumps is that they are very accessible; by the removal of a cover, the disc can be taken out, examined, cleaned, and replaced, without disturbing the suction and discharge pipes.



The session of the Central Institution of the City and Guilds of London Institute will commence on October 2nd. The Clothworkers, Siemens, Mitchell, and Institutes' Scholarships will be competed for at an examination held on September 25th to 26th. The courses of instruction include lectures on mathematics, engineering, chemistry, and physics, and laboratory and workshop practice.

## ODDS AND ENDS.

The French *Moniteur Officiel du Commerce* recently stated that the cocoon-harvest in the neighbourhood of Messina, which promised this year to be exceptionally favourable, has unhappily been injured since the severe heats by the appearance of disease. This has been particularly the case in the mountainous districts. The price of cocoons immediately rose by 10 to 15 per cent.

Private letter boxes for use during the night may be rented at all post-offices at which a night staff is on duty, and at which there is a delivery of letters to callers during the day. This arrangement will enable the public to obtain, as far as practicable, during the night, letters (i.e., postal packets paid at letter rates of postage) which, in the ordinary course, would not be delivered until next morning. A renter of a night letter box can thus, during the hours of attendance of the night staff, obtain letters arriving after the office is ordinarily closed to callers, provided that such letters be enclosed by the sender in red envelopes clearly marked in the upper left-hand corner, "Special private box night delivery."

The following regulation on the Parcels Post to Greek ports appears in the Board of Trade Journal:—Parcels not exceeding 7 lbs. in weight can now be received at any post-office in the United Kingdom for transmission to the following ports in Greece, viz., Argostoli, Calamata, Catacolo, Cerigo, Corfu, Patras, Piræus, Santa Maura, Syra, Volo, and Zante, at the rates of postage and under the conditions mentioned below. Parcels for these ports will be included in the mails for Vienna despatched from London via Hamburg every Wednesday, Thursday and Saturday morning, and in the mails for Cologne despatched from London every morning and evening. *Rates of Postage*.—For a parcel not exceeding 3 lbs., via Hamburg, 2s. 6d.; via Cologne, 3s. Exceeding 3 lbs., but not exceeding 7 lbs., via Hamburg, 3s. 3d.; via Cologne, 3s. 6d. *Dimensions*.—No parcel must exceed 2 ft. in any direction.

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Cleaning wool. F. A. Owen, London.	1st Aug. 11,156
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### Patents Scaled.

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6,032	6,643	10,148	10,327	10,412	13,431	10,591	15,935
7,653	2,093	2,653	6,181	6,443	6,444	5,860	8,045
8,861	8,862	9,133	10,674	10,804	10,805	10,814	10,835
10,894	11,687	12,138	13,478	15,253	6,500	6,599	6,620
6,697	6,718	6,788	8,099	8,560	8,772	10,318	10,889
10,961	10,977	11,065	11,081	11,461	12,270	12,442	14,291
2,930	3,908	6,989	7,075	7,076			

# The Journal of Fabrics

AND

## Textile Industries.

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### Notices.

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Readers are invited to forward items of interest to the Trades concerned.

The Proprietors will feel greatly obliged if any of their readers, in making enquiries of, or opening accounts with, Advertisers in this paper, will kindly mention the *Journal of Fabrics and Textile Industries* as the source from whence they obtained their information.



### Washing and Treatment of Raw Wool.

BY JOSEPH FALKENBACH, U.S. CONSUL, BARMEN.

The original quality of any wool may be altered beyond recognition by climatic influences, also, by carefully tending the sheep, but the general method adopted is the crossing of various breeds. It is quite possible for the wool-grower of the present day to change a flock of sheep with long uncured wool into a flock with short, thickly-curved fleeces. So great a metamorphosis, however, can only be brought about gradually, and during the course of several generations of sheep. Practically, a most extended use is made of this method of changing or improving the breed, and by means of it two principal species of wool may be grown totally differing from one another. The variation in the character of the wool has resulted in a distinct and separate treatment and a particular manufacture being hit upon for each species, and, consequently, almost two different industries have been created, viz.:—the carded wool (woollen cloth) and the worsted or stuff manufactures. In the manufacture of woollen cloth, the short-curved carded wool which attains the greatest fineness of fibre is used, while for stuff manufacture, long, uncured worsted wool is employed. Raw wool, which is covered with grease, dirt, and all manner of filth, to the extent of treble or four times its own weight, must undergo a thorough cleansing and scouring before it can be manufactured into cloth. We may leave out of consideration the so-called fleece washing on the body of the sheep, by which only a small portion of the grease and dirt is removed. The actual operation of washing the raw wool is of the utmost importance, and upon its successful and thorough performance depends to a great extent the further

suitableness of the wool for manufacturing purposes. If we now inquire what are the conditions of a good and thorough wool washing, the answer will be, in addition to a perfect cleansing, it is of vital necessity to preserve the staple, by which is meant to secure an even and parallel lying of the individual fibres. It must be clear to every thinking man that the more entirely this natural position of the fibres is preserved, and the less they are entangled, the less will be the tearing in after manipulations, and the finer and more equal will be the yarn. The above remarks apply with the same force to combing as to carding wool, although these different qualities are treated in washing on entirely different principles, as we shall see later on. During the process of washing in warm soap-suds, and of the subsequent rinsing in soap and warm water, it is absolutely necessary to remove, as far as possible, through immediate oiling and stretching, the shrinkage of the combing wool, and to reduce the curling of its individual fibres to the least possible minimum. The contrary is aimed at in the treatment of carding wool. In the latter case, the chief care is not only to retain the intricate shrinking power, but to increase it by the washing and rinsing process, and to save in every direction the flexibility of the fibre which plays so integral a part in the fullery. The shape of the fibre of unwashed wool is, to some extent, an unnatural one, accurate experiments having demonstrated that its natural curling power, and, in consequence, the compact roundness of its form, are to some extent hindered during growth. As soon as the fibre is freed from grease by washing, the wool falls back by its own elasticity to its natural shape, and becomes really more curly than when in the grease. This propensity is of great importance in carding wool, and, the more carefully it is preserved during the preparatory treatment, the greater are the shrinking faculty and pulling capacity. If we would now learn what are the means to be employed for satisfying all reasonable demands for a practical wool-washing process, special consideration must be paid to the washing ingredients used, the several manipulations customary, and the various kinds of machinery by which the old fashioned hand labour has been supplanted. Wool washing in the past:—If we look back into the past history of the woollen manufacture, and examine more particularly into the nature and fashion of the wool washing practised by our forefathers, we find as early as 1774, in a scientific journal of that date, a detailed treatise on the importance of the washing and scouring of wool (Jacobson's Manufacture of Woollen Stuffs). Jacobson recommended, above all, a thorough washing of the raw wool in lukewarm water, for if, he observes, the water be too warm, the yolk will be scorched, while, if it be too cold, the yolk will not dissolve. At the same time, he advises and addition of urine to the scouring bath, with the express statement that soap-suds might be substituted for urine. This manner of treatment, however, was not only more expensive and more cumbersome but, led to a considerable loss in the intricate softness of the wool. Jacobson further recommends the following method of testing whether the wool has been sufficiently scoured:—Some wool is taken from the urine bath and squeezed, if it swells out on the open hand, the wool is ready for the rinsing tub. Another periodical, published about the same time as the above (1774), contains an article entitled "The Woollen Manufacture at Eupen," in which the application of urine in wool washing is mentioned as being in general use at that time. A tendency soon manifested itself to improve a method of wool washing which must have always been distasteful, and, the science of chemistry being still in its infancy, the wildest and most absurd experiments were tried. Thus, it inevitably came to pass that charlatanism found a wide field for the display of its ingenuity in this direction, and gave to the world a number of so-called washing surrogates, which, under bombastic and quack-suggesting names, hid such simple substances as soap-bark and soap-wort (quillaya saponaria and gypsophila fastigiata), mostly in the form of powder. A catalogue of these arcana of the wash tub would take up too large a portion of our space, and could serve no useful purpose in the present enlightened time. The old method of scouring the wool with putrid urine had its undisputed merits, and the Schlieper process can alone be compared with it so far as preserving the softness of wool is concerned. According to the Polytechnic Central Journal of 1863, page 393, Schlieper uses a composition consisting of 20 parts of soda, 5 of oleine, and from 3 to 2 parts of ammonium-chloride. The greater quantity of ammonium chloride is to be employed when the fibre is fine; the less quantity, however, when the fibre is coarse. The peculiar effect of this compound consists in completely preserving the softness and flexibility of the fibre, at the same time removing all greasy substances, the latter result being attributable to the presence of the oleine and the ammonium-chloride. Ammonium-chloride and soda combine to form carbonate of ammonium and chloride of sodium, together with ordinary oil-soap, and a corresponding quantity of bicarbonate. The bicarbonate removes the caustic effect from the soda, while the oleine promotes the formation of an emulsion with the grease of the wool. It had already been a fact of experience that a good result could be obtained by an addition of common salt to a solution of soda. Under this treatment, the driest Cape wool and the greasiest wool alike became extremely clean and brilliant, and at the same time as soft and mellow as velvet. Without risking an exaggeration, this method of scouring raw wool may be safely recommended. Of course, this process of washing is always a very expensive one, and it has, in consequence, been abandoned in all wool washing establishments which work for profit. In this case, all other washing ingredients have given place to soda, by the careful use of which—more particularly of ammoniacal soda

(solway soda) which has lately been manufactured by most superior processes—very satisfactory results are obtainable. Singularly enough, Joclet, in his little work, "The Chemical Treatment of Sheep Wool," recommends caustic soda as being specially adaptable for scouring wool, owing to the more energetic effect of the hydrate on the grease. This is to some extent true, but the fact has long ago been proved that carbonate of soda not only saponifies the yolk, but operates in a very destructive manner on the wool fibre. For this reason, caustic soda must be regarded as the least satisfactory preparation for wool washing. Joclet adds, moreover, that competent professional experts have abandoned the use of caustic soda, because it gives to the wool a yellowish tint, and deprives it of its flexibility and its so-called "grip," but, he declares, that the injurious effect of this agent can be neutralized by adding to it a solution of ammonia. As, however, ammonia, or rather in this case spirits of sal ammoniac, is likewise a caustic of kali, it is incomprehensible by what manner of means the caustic soda can thus be deprived of its destructive properties. Grotte says on this subject:—The qualities of soda used in wool scouring are by no means uniform in respect of pureness. Above all things, this soda must be free from any particle of caustic soda, because the latter has a decomposing influence on the fibre of the wool. Schapinger describes, in the German Industrial Journal, for 1866, page 183, a process by which any caustic soda, casually present, is rendered harmless by being converted simultaneously into bicarbonate and sesquicarbonate of soda. To a bath containing 800 parts of water and 1 part of soda, a quantity of sulphuric acid (ten-fold diluted), and equal to about 3 to 6 per cent. of the quantity of soda, is added. Carbonic acid is thus given, which rapidly forms an emulsion with the yolk, without, in the least, affecting the fibre. Considerable saving of time and labour, however, is effected when it becomes unnecessary to resort to such means as above described, by using a soda entirely free from all caustics. Such a soda is the above-mentioned ammoniac soda, which may be considered an almost pure chemical product, as it contains from 98 to 99 per cent. carbonate of soda. Equally important as the exact quantity and quality of soda used is the right temperature of the scouring bath. For the former, no rules can be laid down, and, in the case of the temperature, it is just as impossible to give exact directions to meet all contingencies. Generally speaking, a heat of 40-50° R. is the average temperature necessary for a scouring bath, and as the difference between these two figures is considerable, it is obvious that the exact point can only be hit upon by practice. The same must be said of the length of time during which the wool must remain in the bath. In this respect, the washer must be guided in a great measure by the quality of the wool to be washed. When the scouring process, or the solution and saponification of the wool grease, is accomplished, and the wool taken out of the scouring bath, it must thoroughly be rinsed. This is done in a bath of clear lukewarm soap-water in the case of combing wool, as we have already stated, while carding wool must be rinsed in cold river water. The low temperature of the rinsing water is here a matter of great importance, for it has been demonstrated by experience that washing of wool during the winter gives a far better result than washing during the summer. Joclet observes on this point:—No very clear explanation can be given for this generally known principle, although every expert washer will corroborate the fact that, during the summer months, a total elimination of grease by washing is impossible. It may be, however, that, through immediate rinsing in ice cold water, the dissolved resin-like greasy substance quickly coagulates, and is thus more easily separated from the wool. In connection with the above, we must add that, although many woollen manufacturers are so comfortably situated as to be able to wash their wool supply during the winter and desist from summer washing altogether, such a plan cannot be adopted as a rule, or be carried out under all circumstances. Washers and dyers are, by occupation, compelled to wash all the year round, even during the hottest season, whereby they run the risk of supplying wool which is not entirely free from grease. The most extraordinary tricks are then resorted to, with varying success, for obtaining a satisfactory result. For instance, when the temperature of the river, or other rinsing water, rises to 15° R. the calamity begins, for the well scoured wool comes out of the rinsing machine in a sticky, muddy, and uncomely condition, and the higher the temperature of the water rises the greater is the resultant evil. In such a dilemma the following treatment has always been found successful:—The temperature of the water in the scouring basin is raised to 50-54° R., and the bath itself is kept fairly "strong," only a very small portion of the wool, say a quarter of the quantity to be washed, being soaked in it. After five minutes, at the most, the wool is taken out of the bath and quickly rinsed under a very strong stream of cold water. To put the matter in a nutshell, we may say that the following points should be paid attention to in the hot season:—High temperature, a strong bath, short soaking of small quantities of wool, and rinsing in plenty of water. Forced as this treatment of the wool may appear, its results have never been bad. The wool always dyes well without losing its colour, the whole dyeing process remaining unaffected and satisfactory. Having fully discussed the subject of wool scouring and washing ingredients, we may consider now more closely the mechanical arrangements which are employed in wool scouring. From the primitive process of washing by hand, which is still in vogue in minor establishments, to the most complete washing machine of the present time, is a mighty step, and yet the progress which these two extremes represent has been the work of a comparatively short space of time. The first experiments

in the construction of wool-washing machinery date back to the last century, but were more or less ineffectual until 1830, when the epoch-making inventions in this sphere of industry commenced. The first really useful washing and scouring machine was constructed in 1832 by Sehlmacher. In this invention, the rinsing rake, which was formerly operated by hand, was set in motion by a crank, while the rinsing itself was carried on in a wash house, and no longer required to be done in the river. The water necessary was conducted through pipes into the rinsing or scouring machine, out of which it runs, after being used, without any assistance. A much more perfect washing machine was built by Pelzer about the year 1855. On the top of an elliptically shaped vessel are two paddle wheels with curved hooks, by which the wool, rotating with the water around the axis of the machine, is submerged. There are many modifications of the original idea. One inventor makes use of flying pinions, another of rakes, a third of paddle wheels on one side and rakes on the other, &c., each claiming special advantages for his construction. Herr Lobner, in Dalhhausen, near Lennep, has adopted the following method:—He avails himself of the water supply as a motor, so that a single flying wheel is sufficient. For this purpose, he lets the supply pipe enter the side wall of the washing machine about eight inches above the bottom of the vessel, just opposite the fly wheel. The stronger the supply of water, the greater is the pressure from the reservoir, and, consequently, the more effective is the rotation of the water in the washing machine. Thus, not only considerable power is saved, but the wool is only treated by one flyer and the current of the water, and a superior mellowness in the wool is obtained. Even the long fibre Buenos Ayres wool does not become entangled, though, formerly, it happened only too often that long wool twisted into lengthy braids. The system may not be applicable in every case, but it will answer very well where the water runs into the waste basin at considerable pressure. The stronger the rush of water, the less the wool needs to be turned in the washing machine, and the less danger there is of the individual fibres becoming twisted and entangled. Since the scouring of so-called smut wool (wool not washed on the body of the sheep before shearing) has been commenced, the whole method of wool washing has had to be changed. In most cases, the ends of fibres in the unwashed state are covered with grease and dirt to such a degree that a mere soaking of the wool in wash lye is not sufficient to dissolve the same. To accomplish this, a procedure has been devised by which the soaked wool passes between solid rollers, which are pressed together by strong springs or levers, before it goes into the rinsing machine.

(To be continued).

### Manufacture of Figured Quilts and other Figured Fabrics.

An invention, relating to the kind of cloth known as "Mitcheline," for which a patent was granted in 1868, has for its object the obtaining of a bold figure on a plain ground, the figure being satin or twill as desired. In carrying out the improvements, a loom of the ordinary construction is employed, and two yarn beams are used. The yarn from one beam is to form the raised part of the figure, and is termed "face yarn," it is worked by four healds; the yarn from the other beam forms the ground and the outline of the figure, and is termed "stitching yarn," and is worked by a jacquard or other machine. An equal number of ends is put on each of the beams. Coarse and fine weft are used from two shuttles, two picks of coarse, and then two picks of fine, weft being put in alternately. An important feature of the invention consists in the "shedding," or manner, in which the face yarn is raised, when the coarse picks are being put in, where an equal number of ends are used in the face yarn and in the stitching yarn. To carry out the improvements, four healds are used to work the face yarn, and only one of the four healds is raised at a time when the coarse picks are being woven, that is, only one quarter of the face yarn is raised to each coarse pick; the face healds can be so manipulated in the working (but only one raised for each coarse pick) that the cloth produced is a satin or a twill on the face of the raised figure. In conjunction with the above mode of working the face yarn when the coarse picks are being woven, the fine picks can be put in, according to the various modes in which the face yarn can be worked, by raising one, two, three, or all the face healds to each fine pick, and, by the before mentioned methods of weaving, the back of the cloth can be made a satin, twill, or rib. Also, on the same basis of using an equal number of ends of face yarn and stitching yarn in combination with two picks of coarse weft and two picks of fine weft alternately, when putting in the coarse picks, two of the four healds are raised so as to have one face end up and one face end down, and, in

conjunction therewith, the fine picks can be put in by raising one, two, three, or all the face heads. By these methods of shedding the face yarn, a fine satin figure can be produced on the face, and the back of the cloth can be made a satin, twill, or rib. It will be seen that the principal feature of the invention consists in the shedding, or the manner, in which the face yarn is raised where the same number of ends is used in the face and stitching yarn in combination with two picks of coarse weft and two picks of fine weft. The improvement applies to both white and coloured goods. Another invention, also relating to figured fabrics, such as quilts, toilet covers, table covers, and curtains, has also been patented, the object being the production of a reversible figured fabric, composed of two distinct cloths, either plain, twill, or other suitable weaves, the two distinct cloths being bound together and figured upon by another warp of one or more colours. The colour of the distinct cloths may be the same for both sides, or one side may be a different colour from the other. To accomplish this object, in the weaving of the improved fabric, a jacquard machine is employed to actuate the figuring and binding warp or yarn, and heads to actuate the ground warp or yarn which forms the two distinct cloths. The fabric is woven with two shuttles, when the colour of the cloth on one side of the fabric is to be different from the colour of the cloth on the other side of the fabric, but when the grounds on both sides of the fabric are to be of the same colour, one shuttle only is used. When manufacturing the fabric with two plain cloths of different colours and two shuttles, four heald shafts are required, and the action of the jacquard machine and heald shafts is as follows:—1st pick.—The jacquard machine raises the yarn which is to form the figure on the top side of the fabric, and the first heald shaft is also raised. 2nd pick.—The jacquard machine raises the yarn which is to form the figure on the top side of the fabric, and the second heald shaft is raised. 3rd pick.—The jacquard machine raises all the figuring yarn except that portion which is to form the figure on the under side of the fabric, and the first, second, and third, heald shafts are also raised. 4th pick.—The jacquard machine raises all the figuring yarn except that portion which is to form the figure on the under side of the fabric, and the first, second, and fourth, heald shafts are raised. The first two picks are from the same coloured weft, and form the cloth on the top side of the fabric, and the last two picks are from the other coloured weft, and form the cloth on the under side of the fabric, and the figuring warp is hidden between the ground cloths, except where it produces the pattern, which also serves for the entire binding of the reversible fabric together. When making the fabric with the same coloured ground on both sides, the same order of picks is used as for two colours, or the picks may be put in the following order:—1st, then 3rd, then 2nd, then 4th, that is to say, instead of putting two picks in together on one side of the fabric, and then two picks on the other side, one pick is put to one side of the fabric, and then one pick to the other side alternately, or the picks may be used in the order last named for a fabric made with different colours on each side, and, what is called a pick and pick loom with two shuttles may be used. Instead of four heald shafts, which are most suitable for weaving plain cloths, other numbers of shafts are required for twills and other weaves. Another patent has been granted for improvements relating to weaving, which have for their object the production of figures on woven fabrics in such a manner that the same may be of one or more colours, kind, or kinds of weaving, while the ground, or non-figured portion, shall be of another colour, kind, or kinds, of weaving, thus producing a sharp contrast between the figure produced and the surface upon which it is laid. To accomplish this, two sets of warp threads are employed, either on one beam, or on separate beams, one set being of one colour, kind, or thickness to form the ground, and the other set being of another colour, kind, or thickness to form the figure. The ground warp is a full warp, but the figure warp may either be a warp of one end to one end of ground warp, one end to two ends of ground warp, or otherwise proportioned according to the class of work required. One shuttle need only be employed, although two or more could be used for special purposes. The shuttle thread is preferred to match the ground warp, which warp may be actuated by the jacquard, or other motion, so as to weave plain cloth, twills, or other, or combined, ground weaving, and, when the figure is

not required, the figure warp is in like, or similar, or in any known manner, so actuated, but these actuations take place at alternate, or different, picks or motions of the loom. The result of this is that, while such alternate or differentiated weaving is proceeding, a double fabric is produced, the ground warp forming one face thereof, and the figure warp the other. When it is desired to form a figure, the requisite threads of the figure warp are raised or depressed, as the case may be, at the same pick or motion as the ground warp is actuated, and such figure warp threads may be floated at various lengths to form a pattern on the surface. By this means, the two fabrics are stitched together at the points where such figure warp threads are raised or depressed to form a pattern, and at all other points, being woven into a separate fabric, the ground warp presents a solid woven effect which forms a result of a novel and pleasing character. The improvements may be applied wholly across the piece of the fabric being woven, or may be applied in portions for the production of striped goods, or otherwise, and may be combined with any other form of weaving. The warp threads which are employed to form the figure may be actuated, when producing the alternate or differentiated weaving at the back, in such a manner as to make plain weaving, twills, or regular, or irregular, floated fabrics according to the nature of the cloth desired. And other variations in detail of actuation and of design may be made without departing from the peculiar character of the invention.

### Honiton versus Nottingham Lace.

A correspondent, in a pathetic letter to a contemporary, laments the decadence of the Honiton lace industry, and the *London Daily Telegraph*, in a leader, comments upon lace industry in general. It says, "Boards, according to Lord Eldon, are both physically and morally objectionable, since a board has neither a body to be kicked, nor a soul to be saved; and the same characterisation by analogy applies even more forcibly to all artificial interferences with the laws of supply and demand in regard to certain kinds of manufacture. Sumptuary laws and highly prohibitive tariffs may for a while secure the exclusion of one article from the market, and force the consumption of another. Thus, at the period when the most stringent legislative edicts forbade the importation of Indian "painted calicoes," a law corresponding in intolerance prescribed, under heavy penalties, that every dead body should be buried in a woollen shroud, and, for awhile, a check was imposed on the cotton manufacture, and an artificial impetus given to that of woollens. Pure sentiment, however, unless backed by an Act of Parliament, has rarely had any amount of appreciable success in fostering a nascent industry, or in reviving a declining one. \* \* \* Our womenkind at the present moment, are imbued with an intense desire to possess plenty of finery in apparel, and they are supremely indifferent as to whence that finery comes, or by whom it is fabricated, so long as it looks well, and can be procured cheaply. It is also a "sine qua non" that the articles which the ladies demand should be ready to their hand for the asking, and this is why machine-made products are often preferred to hand-made ones, since, of the first, there are usually abundant stocks ready, while, to obtain the latter, it is necessary to give an order which obviously takes some time to execute. To such circumstances is plainly due the fact that one of the most interesting, and the most beautiful, feminine industries carried on in the South of England for nearly four centuries seems to be doomed to extinction. \* \* \* Now, however, the rage for variety and cheapness has driven hand-made laces from the market, and ladies prefer machine-made imitations, which they can buy at sixpence three-farthings a yard, and can change every month. Honiton and Brussels, and Malines and point d'Alençon, are all beautiful in design and rich in appearance; as flounces they are most fascinating, but their texture is too close to be used with advantage as a veil for the face and those parts of the dress which it is desired should be most conspicuous. A bridal veil of real Honiton may be truly a "very noble and chaste veiling," but it will as effectually conceal the features and the bust as the "yashmak" of a Turkish "khanon," which is not precisely the consummation most devoutly wished for by the sweet and guileless creature who, clad in pearly satin or

shimmering silk, modestly enriched with pearls and diamonds, blushing approaches the altar of St. George's, Hanover Square, or St. Paul's, Knightsbridge. It cannot fail to be remembered that the manufacture of Nottingham lace is quite as native and quite as exquisite as that of Honiton, only at Nottingham there is one of the best schools of design to be found in the three kingdoms: those schools turn out every year crowds of competent male and female students, who earn a fully remunerative livelihood by designing patterns for lace, the manufacture of which, not only in articles for feminine adornment, but in curtains and all kinds of upholstering lace borderings, has reached astonishing proportions. Nottingham also produces lace stockings and lace gloves, rivaling, and in many instances, surpassing, the best Continental products of the kind; while, finally, those implacable foes to commercial sentimentality—capital and industry—have made Nottingham an important centre of the manufacture by machinery. Hand-made lace has not become an extinct industry, but, as a rule, the many-storeyed mill, with its clanking machines and its crowds of busy artisans, earning a fair day's wage for a fair day's work, has superseded the flower embowered door-way with the rustic mother busy over her pillow, and directing the small fingers of her offspring, while her own digits are dancing among the bobbins. How are the ladies of England to respond to the touching appeal made to them to support and revive the languishing industry of Honiton? It must be borne in mind that the decay of this particular manufacture at the pretty town in the hundred of Axminster is not by any means a new thing. Full fifty years ago, it was noted that the lace-making, for which the place had once been renowned, was no longer carried on to any considerable extent, although sprigs for the decoration of the Tiverton patent net, were still made at Honiton, and retained their former celebrity. How stands it with the making of sprigs now? or, for the matter of that, with hand-made Tiverton net itself? Lace-making, too, only filled the place which had once been occupied, and at a very early period, by the serge manufacture. Have serges gone the way of lace? Honiton, as a lace-making centre, seems to have reached its apogee during the last half of the eighteenth century, and the first fifteen years of the present one. In 1815, just before the pillow lace trade began to dwindle into insignificance, a Honiton scarf was worth from thirty to fifty guineas, and a veil from seventy-five to one hundred. Of course, the manufacture had been carried on in Devon for many generations previously, but it would not appear to have had much more than a local celebrity. A handkerchief, a fichu, a scarf, a flounce, a chemisette, of real hand-made Honiton of the best quality, is still a thing of beauty, and should be a joy for ever, but the feminine public at large demand, and are plentifully supplied with, machine-made lace, native in its manufacture, quite as beautifully designed as the hand-made article, and wonderfully cheap."

### Customs Tariff.

**TUNIS.**—*Abolition of Duty on Exports of Wool, washed and unwashed.*—A despatch, dated the 25th August last, has been received from Mr. H. Ricketts, Her Majesty's Consul at Tunis, stating that the dues of two and a half piastres (piastre 54d.) per quintal previously collected by the Monopoly of the Dar el Geld on wool, washed and unwashed, when exported from the ports of Tunis, are to be abolished from this month.

**UNITED STATES.**—The following decisions, affecting the classification of articles in the Custom's tariff, and the application of the Custom's law of the United States, were recently given by the United States Government. Where importers are indebted to the Government on overdue Custom house bonds, they are not entitled to repayment of excessive duties, the Treasury Department being of opinion that the penalties prescribed in such bonds have thereby become debts due to the Government, which can only be discharged by payment of the penalties or cancellation of the bonds. An article called "cotton felt," which consisted of cotton "molleton," a woven fabric composed of fine warp-yarn and a very coarse spun weft-yarn, the cloth having a nap on both sides, is held to be dutiable at the rate of 40 per cent. *ad valorem*, under the provision in Schedule I. (T. I., 320) for "cotton cloth \* \* \* bleached, under 100

threads to the square inch, and costing over 10 cents. per square yard." Certain so-called "samples," which consisted of 281 pieces of coat-linings, each piece 1 yard in length, and 32 and 54 ins. wide, respectively, are held to be liable to duty, the same being samples of a commercial value. A fabric called "church-seating," which is intended for use as mats or cushions for seats in a church, and is composed of hemp and wool, of which wool is a substantial feature, is not entitled to entry as hemp carpeting, under Treasury Department's decision of May 29th, 1886. An article claimed to be cotton twine, but which upon investigation was found to consist of cotton thread not wound on spools, which is intended for making loom harness for weavers' use, is held to be dutiable at the rates, according to value per pound, prescribed for cotton thread under the provisions in Schedule I. (T. I., 318). A fabric manufactured from jute, of a closer texture and less width than the usual bagging of commerce, which is too expensive for use in the manufacture of bags or sacks, and which, nevertheless, although used to a certain extent for manufacturing oil-cloth, is not the oil-cloth foundation or floor-cloth canvas of commerce, is held to be dutiable at the rate of 35 per cent. *ad valorem*, under the provision in Schedule J. (T. I., 334) for "other manufactures of jute \* \* \* not specially enumerated or provided for."

A fabric which is commercially known as tapestry, manufactured of worsted and cotton, which is intended to be used as panels or hangings for walls, and not as coverings for floors, cannot be classified under provision in Schedule K. for Aubusson carpets, but is dutiable at the rate of 35 cents per pound, and 40 per cent. *ad valorem*, under the further provision in said Schedule (T. I., 63) for manufactures of worsted, &c., valued at over 80 cents per pound.

**CANADA.**—The following decisions, affecting the classification of articles in the Canadian Customs tariff, have recently been given by the Canadian Customs authorities:—Jute yarn, plain, dyed, or coloured, when imported by manufacturers of jute webbing and jute cloth, to be used for those purposes only in their own factories, to be free from Customs duty until the end of next session of Parliament. Two ply cotton twine yarn, in cops only, made from single cotton yarns finer than No. 40, and used by the manufacturers of Italian cloths, cashmeres, and cotton cloths, for the selvaige of said cloths, and for these purposes only in their own factories, free until the end of next session of Parliament. Yarns made of wool or worsted, the same being gennapped, dyed, and finished, when imported by manufacturers of braids, cords, tassels, and fringes, to be used for these purposes only in their own factories, free until the end of the next session of Parliament.

**VICTORIA.**—The following is a list of articles now dutiable under the Customs tariff of Victoria, but which it is proposed to admit free of duty on and after 1st January, 1889:—Carpeting, being printed felt; felt, carpet, fabric gloves, silk piece goods, viz., lace and net, up to 9 ins. in width, ribbons and ribbon velvets; line-fillets for bookbinders; woollen dress piece goods, being cashmeres, nuns' veiling, alpacas, llamas, coburgs, crape cloths, paramattas, baratheas, Russell cords, Persian cords, homespun, fancy dress, wineys, béiges; woollen dress piece goods, being costume cloths, serges, Melton cloths, and tweeds, under 25 ins. for single widths and under 44 ins. for double widths; woollen piece goods, being baizes, cloth tabling, collar checks, saddlers' serges, and table covers.—*Board of Trade Journal.*

**SPAIN.**—The Spanish Customs tariff has recently undergone some modifications, the most important being the following:—Tulle, to which a chain-stitch border has been applied, not in the loom, but in a separate machine, has to pay a surtax of 30 per cent. Coloured cotton tissues, in which the warp and the weft each consists of four threads leaving equal spaces and forming a kind of pattern, are subject to a duty of four pesetas per kilo.

A new process has been devised for cleaning lubricating oil that has once been used, so that it can be used again. The oil is poured gently over a bed of iron, which is strongly magnetized. The heaps of iron fragments constitute a magnetic sponge which stops all the particles of metal, especially those of iron. The oil is then passed through two hair filters, and comes out perfectly clean.

### Black Dyeing on Wool.

It is a mistake not to scour the wool properly before dyeing it black. Wool, besides its natural fats, absorbs oil during the carding and spinning. Without proper scouring, not only is the dyeing bad, but the goods leave the finisher with an unpleasant odour and a greasy feel. The wool should always be scoured, even if it is to be dyed black. The scouring should be done in two baths, the first should contain soda and soap, the second soap alone. Where there is very little oil, one bath will suffice. It should then be rinsed with warm water before chroming. For fine wools, it is important to dye a black which will not bleed or spot, for the bleeding of the colour not only stains the hands of the finisher, but alters the appearance of delicate shades or of whites when present in the goods. To obtain a non-croaking black, the goods must be scoured and rinsed. The chroming should be done with 3 pounds of chrome and 0.5 pound of blue vitriol. Enter at 170° F., and boil very gently for one hour, and then hang in the air for another hour before rinsing. The dye-bath should be prepared in advance; boil for one hour 70 to 90 pounds of chip logwood. The temperature should be 170° F. when the wool is entered, and it should be boiled very gently for an hour. Rinse and pass through a cold bath containing a clear solution of 5 pounds of bleaching powder, let it remain there for twenty minutes with frequent turning, wash and dry. The chrome bath can be used again after adding 2.5 pounds of chrome for every 100 pounds of wool and 0.5 pound of blue vitriol. The dye-bath can also be reserved and used again with an addition of 40 to 50 pounds of chip logwood for 100 pounds of wool. If it is desired to dye a black upon yarn which will stand fulling, use the following method:—For 100 pounds of wool take 2.5 pounds of chrome and one pound of blue vitriol. Enter, boil gently for two hours, allow to stand in the air for two hours, wash, dye in logwood as above, but take care to boil it very slowly, and lengthen the dyeing to one and one half hours. Cool, and without washing, chrome again at 120° F. with 1.5 pound chrome. After working, allow to stand 30 minutes, then wash and dry. If a black which will bear long exposure to the light is desired, follow the above instructions, but use 2.5 pounds of chrome and 1.5 pound of blue vitriol for chroming. The dyeing should be lengthened to two hours. After dyeing, pass through a bath containing 4 pounds of copperas, and turn the wool from time to time for 45 minutes. To produce a deep jet black or a brownish black mordant with 2 pounds of chrome and 0.25 pound of oil of vitriol; boil one and one-half hours, dye with 70 pounds of logwood for one hour. After cooling, return the wool to the chrome, wash and dye with:—logwood, 50 pounds; camwood, 20 pounds; alizarine W.Y., 1.5 pound. If this is too brown, replace the camwood and alizarine with Victoria violet. A greenish black can be obtained by mordanting with 2 pounds of chrome and 0.5 pound of blue vitriol, and dyeing with 70 pounds of logwood and 20 pounds of chip fustic. Without washing, chrome again with 1.5 pound of chrome for one hour at a boil, wash and dye finally with 40 pounds of logwood and 10 pounds of fustic. The work must be thoroughly done if bleeding is to be avoided, the chrome and logwood baths must not be used more than twice, and the wool washed after each bath if nothing is said to the contrary. The employment of a very weak bleaching powder bath may be useful, but it blues the blacks, and to prevent the blacks from becoming too blue, the dyer should try the effect of it on a skein before entering the lot. To produce a blue black on woollen yarn, mordant with 1.5 pound of chrome and 1 pound of alum. After mordanting one and one-half hours at a boil, dye with 80 pounds of logwood until the shade is reached. Do not enter too warm, or the colour will be uneven. Sometimes a small quantity of ammonia is added to prevent purpling by the alum. This addition is made when the desired depth of colour is reached; then half of the bath is run out, cold water is added to reduce the temperature to 160° F., then the ammonia is added, and the yarn left in for 30 minutes, and given some turns at the beginning. The following receipt is for a black which will stand sulphuring in the bleaching chamber. This is desirable in certain cases where the goods are bleached after fulling. Dyers can bottom with vat indigo, and thus render

the black fast, but they do not usually use such an expensive method. Mordant the yarn with 2.75 pounds of chrome for one and one half hours at a boil, wash, dye at a boil for 45 minutes, with 45 pounds of logwood, lower the temperature to 160° F., add 10 ounces of oil of vitriol, enter, raise again to a boil, and maintain it for one and one half hours. Now wash and return to a dye-bath, for one hour at a boil. This second dye-bath should be prepared by boiling for 45 minutes, 45 pounds of logwood and 6 to 8 pounds of camwood. After dyeing, cool the bath to 175° F., and add 2 pounds of copperas, enter again, raise to boiling, and keep there for 30 minutes. Wash and dry.—*Industrie Textile.*

### To Detect False Olive Oil.\*

Put into a test tube 1½ grains of pure albumen (this should be greatly heated in the flame of an alcohol lamp to expel any remaining moisture in the albumen which might otherwise modify the exactness of the result), then add 3 cubic centimetres of nitric acid, and 10 cubic centimetres of the oil to be tested (the quantity of each ingredient used is, of course, immaterial, provided the above relative proportions are maintained; a test tube graduated metrically is the most convenient for the purpose) the mouth of the tube is then closed with a cork to prevent the boiling over of the liquid during ebullition, but pierced with a small orifice to permit the escape of vapour which would otherwise explode the tube. The materials are mixed by shaking, but the nitric acid quickly settles to the bottom. Now warm gently in the lamp the part of the tube containing the oil, then apply the flame to the underlying stratum of acid. A fierce ebullition soon ensues, and, when this is at its height, plunge the tube into ice water sufficiently cold to chill the contents to 4° centigrade, or its equivalent 40° Fahrenheit. During the cooling process, there is developed an oleaginous precipitate, ranging in colour from pale yellow to reddish-brown, according to the proportion of cotton-oil contained in the tested sample. The experiment requires only the simple apparatus above mentioned, and occupies only four or five minutes. The standard tint in each grade is produced by dissolving the stated number of units of each pigment named in 100 units of water. For this purpose, ordinary dry cake water colours are most convenient. (1.) Pure olive oil yields a precipitate tinged like 5 units of Naples yellow, dissolved in 100 units of water. (2.) Olive oil containing 5 per cent. of cotton-oil yields the tint of 5 units Naples yellow, and 4 units of dark chrome yellow, in 100 units of water. (3.) Olive oil containing 10 per cent. cotton seed yields a tint equal to 20 units Naples yellow, 6½ units chrome yellow, and 1 unit Chinese vermillion, in 100 units of water. (4.) Olive oil containing 20 per cent. cotton seed yields a tint equal to 6½ units Naples yellow, 6 units chrome yellow, and 1½ units Chinese vermillion, similarly dissolved. (5.) Olive oil with 50 per cent. cotton-oil yields a tint equal to 5 units Naples yellow, 5 units chrome yellow, and 5 units of vermillion. (6.) Pure cotton-oil yields a precipitate having the colour of 3½ units chrome yellow, 10 units of vermillion, 1 unit of burnt sienna, and one of natural sepia, in 100 units of water.

### Commercial Failures.

According to *Kemp's Mercantile Gazette*, the number of failures in England and Wales gazetted during the five weeks ending Saturday, September 29th, was 411. The number in the corresponding five weeks of last year was 424, showing a decrease of 13, being a net increase in 1888, to date, of 7. In addition to these gazetted failures, there were 338 Deeds of Arrangement filed at the Bills of Sale Office during the same five weeks, making a total in 1888, to date, of 2,594. The number of Bills of Sale published in England and Wales for the five weeks ending Saturday, September 29th, was 1,055. The number in the corresponding five weeks of last year was 1,226, showing a decrease of 211, being a net decrease in 1888, to date, of 752. The number published in Ireland for the same five weeks was 50. The number in the corresponding five weeks of last year was 40, showing an increase of 10, being a net decrease in 1888, to date, of 115.

\* From Report of Frank H. Mason, U.S. Consul at Marseilles, to Department of State.



### ORIGINAL DESIGNS.

On our first plate, we give a design for a Lace Curtain, ornamental in style. The pattern shows one half the width of the curtain.

Our second plate shows a design for Printed Calico for Window Blinds. This should be produced in sage green and Indian red, on a cream ground. The pattern is equally suitable for printed muslin for curtains, and for other such purposes.

On our third plate is a design for a Border for Dress Goods. For the winter season, this style of drapery is to be very fashionable. This design is intended to be produced in two colours, say dark olive with old gold ornamentation. These designs have been drawn by Mr. R. Lord, 10, Ann Place, Bradford.



### MONTHLY TRADE REPORTS.

**Wool.**—For most classes of wools at the London sales there has been a brisk demand, there having been a gain of strength from the opening to the present date. As compared with the July sales, the best classes of wool have ruled  $\frac{1}{4}$ d. to 1d. per lb. dearer, and medium and inferior sorts  $\frac{1}{4}$ d. per lb. higher. At the sales at Leith, there was an average attendance of buyers, and prices were unchanged from last month. In the Yorkshire districts, a fair business has been done, but, owing to some rather heavy failures, a state of uneasiness has generally prevailed, and, in consequence, sellers have used rather more caution than usual in their transactions. Home grown wools are only being held in small quantities, and this fact, coupled with the firmness and higher prices at the London sales, has kept values up to their highest point, and there has been a tendency to higher rates. The yarn trade has been fair, spinners of single hank yarns, mottles and fancies, have secured favourable orders that find full employment to those engaged in this branch of the business. Firm prices have been the rule, and, unless large orders have been offered, spinners have not been disposed to make concessions in rates. In the piece branches, looms have been kept pretty well employed, although on orders for small quantities only. The soft goods branch for the home trade keeps fairly busy, but the demand for America has been quieter. Prices, for the most part, have been without change.

**Woollen.**—There has been a marked improvement in nearly all branches of the woollen trade during the month. In the best kinds of fabrics, there has been some admirable patterns put before merchants, with a result satisfactory to the general run of producers. In the Yorkshire districts, manufacturers of fancy fabrics have, during the past four or five years, owing, in a great measure, to foreign competition, put more energy into the making of effective cloths; this has led to an increase of trade, and cloths are now being produced, which, for neatness of design, brightness of colouring, and general finish, compare most favourably with fabrics manufactured in any other district. The

clothing trade is responsible for a large number of orders that have been given out during the month, and these will keep a great number of looms employed for some time to come. Fine worsteds have again sold well, and these seem likely to keep a firm hold on the market for an indefinite period. Medium qualities have also had more inquiries. Prices generally keep very firm.

**Linen.**—This branch of industry has shown a falling off in many departments during the month, but, as the season for exhibiting patterns is only just passed, orders are fully expected shortly. Damasks have not been turned out in as large quantities as usual, producers preferring to keep looms idle rather than to add further to their stocks. In linen sheetings of fine qualities there has been a fair demand, and the same may be said of towellings and narrow cloths generally, but, in other departments, things have been very quiet.

**Lace.**—In this branch there has been no change since last month, the demand for most varieties being very quiet. The present severity has been quite unexceptional in its duration, but hopes are entertained that a revival will take place in a short time. No novelties have recently been put upon the markets, as there has been little inducement for the production of any new goods that entailed even a slight expenditure. Prices have shown no quotable alteration.

**Cotton.**—The sales of raw material have been for actual consumption, the "corner" in Liverpool, with the consequent curtailing of production of yarns and cloth, has had an effect already on the sales of cotton. Throughout the cotton districts, large numbers of firms have gone on short time, and this has caused a hardening of rates for most descriptions of yarns and cloths as stocks on hand are getting lighter, and the production smaller, than the average. Buyers are not disposed to give higher prices, unless to satisfy their immediate necessities. The home trade in yarns has been rather quiet, and for export there has not been much change during the month. In cloths, a fair number of orders have been given where old rates were accepted, but, where an advance has been insisted upon, very little new business has resulted. The demand for India, China, and the East generally, has been fair, but, for the Continent, only a limited inquiry has been made.

### Parcel Post.

From 1st September, 1888, the postage on parcels not exceeding 11 lbs. in weight for the colonies of Hong Kong (including parcels for China) and the Straits Settlements (including parcels for Johor, Perak, Selangor, and Sungie Ujong) have been reduced to the following rates:—*To Hong Kong and China*.—Not exceeding 1 lb., 10d.; for each pound or fraction of a pound additional, 6d. *To Straits Settlements, &c.*—Not exceeding 1 lb., 9d.; for each pound or fraction of a pound additional, 6d.

*Bosnia, Herzegovina, and Novi Bazar, Java, and Little Popo (West Coast of Africa).*—Parcels can now be received at any post office in the United Kingdom for transmission to places above mentioned at the rates of postage mentioned below. Parcels for Bosnia, Herzegovina, and Novi Bazar, will be included in the mails despatched from London for Cologne, those for Java in the mails for Flushing, and those for Little Popo in the mails for Hamburg.

Rates of Postage.	For a Parcel.			
	Not exceeding 3 lbs.	Exceeding 3 lbs., but not exceeding 5 lbs.	Exceeding 5 lbs., but not exceeding 7 lbs.	Exceeding 7 lbs., but not exceeding 11 lbs.
	s. d.	s. d.	s. d.	s. d.
To Bosnia, Herzegovina and Novi Bazar - -	2 2	2 7	2 10	—
" Java—				
Batavia, Samarang and Sverabaya - -	2 0	3 3	3 3	4 6
*Other places - -	2 5	3 8	3 8	5 1
" Little Popo - -	3 2	3 8	3 8	—

\* Bodjong-Gedeh, Brambanan, Bringin, Broemboeng, Buitenzorg, Delangoe, Depok, Djokja, Goendih, Gogo-Dalem, Kalassan, Kalie-Osso, Karangsono, Kedoengdjati, Klatten, Lawang, Meester-Cornelis, Padas, Passar-Mingo, Pondok-Fjina, Poerwodadi, Salem, Solo (Soerkata), Srowot, Tangeng, Telawa, Tempoeran, Tjepper, Tjileboet, Tjitajam, Toentang (Sataliga), Wetevreden, Willem I.—*Board of Trade Journal.*

**CHAS. L. BAKER & CO., Ltd.,**

Cornbrook Telegraph Works, MANCHESTER.

# ELECTRIC LIGHT.

**MILL LIGHTING A SPECIALITY.**

Manufacturers of Dynamos, Arc Lamps, Switches, etc., etc.

CONTRACTORS TO H. M. GOVERNMENT.

Mills fitted with Electric Bells, Fire Alarms, Lightning Conductors, Engine Stopping Signals in case of Accidents.

**ESTIMATES FREE.**

## The Journal of Fabrics and Textile Industries.

### THE LATEST FRENCH AND ENGLISH PATTERNS.

*For Worsted, Woollen, and other Fabrics, for the Autumn and Winter Seasons, 1889-1890, giving the Latest Designs and Colourings.*

100 SAMPLES FOR £2, CARRIAGE PAID. FOR THE UNITED STATES, 10 DOLLARS.

A Remittance must accompany Order.

Manufacturers, Designers, Managers, and Buyers, should purchase

### DR. CLAYTON'S REGISTERED FABRIC TABLES, SCALES, WEIGHTS & STEEL DIE,

Which enable any person, without calculation, to ascertain at once, from a square inch of cloth, the weight per yard of any fabric, from 17 to 80 inches wide; also the weights of warp and weft therein. We have sold a large number of these which give general satisfaction.

Price 10s. 6d. Post Free.

### PATENTS, DESIGNS AND TRADE MARKS.

*We wish to inform*

MANUFACTURERS AND INVENTORS GENERALLY

*that we are in a position to*

PROCURE PATENTS, REGISTER DESIGNS AND TRADE MARKS,

*and execute all work in connection therewith, upon most reasonable terms.*

IN REFERENCE TO ANY OF THE ABOVE, ADDRESS:—

**H. & R. T. LORD, 10, Ann Place, BRADFORD, England.**

# J. H. RILEY & CO., BURY, near Manchester.

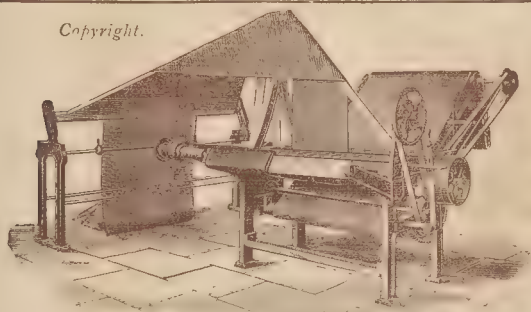
## Specialities.

**RILEY'S PATENT FULL WIDTH  
BURR EXTRACTING OR CARBONISING MACHINE**  
for Dyed and Undyed Woollen Goods.

**WET FINISHING MACHINE**  
for Bradford Dress Goods.

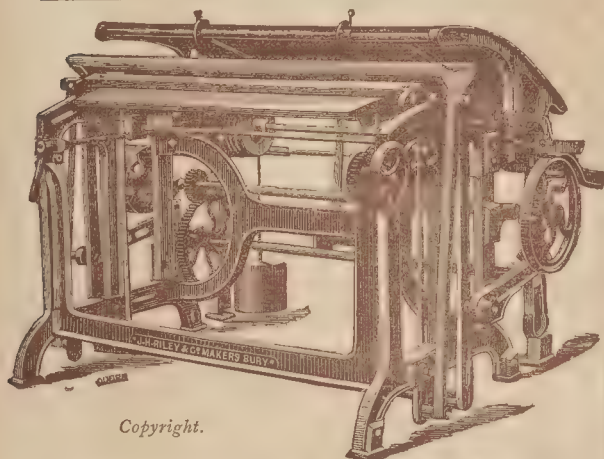
**CALENDERS** for Satteens, Italians, and every class of Textile Fabrics.

*Copyright.*



## ELDER & RILEY'S PATENT RIGGING MACHINE

for Stuffs and Woollen Cloths, as supplied to Her Majesty's Clothing  
Depôt, Pimlico, and to the Indian Government. References to a  
large number of machines at work.



*Copyright.*

## RILEY'S PATENT GRIP CUTTING MACHINE

For Single and Doubled Woollens, the best and strongest Machine made.  
We have some scores of these machines at work.

**J. H. RILEY & CO.,  
BURY, NEAR MANCHESTER.**

# JOHN DOWNHAM & Co. BURY, near Manchester.



**ELDER'S RIGGING MACHINE,**  
WITH DOWNHAM & CO.'S PATENTED IMPROVEMENTS,  
For Doubling all kinds of Woollen and Worsted Goods lengthwise.

**IMPROVED CUTTLING MACHINES**  
For Folding Single and Double Woollens and Worsted.

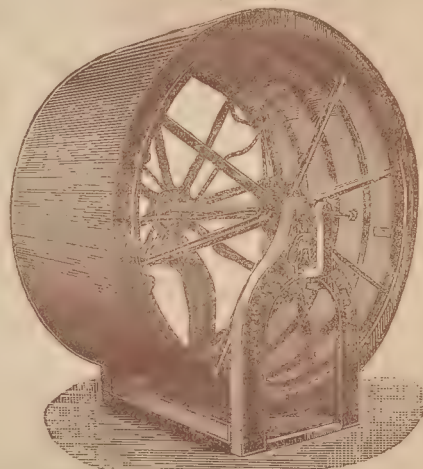
**STEAM DRYING MACHINES,**  
WITH TIN AND COPPER CYLINDERS,

Calenders, Beetles, Dye Becks, Dye Jigs, &c.  
Prices and Drawings on application.

**J. H. PICKUP & CO.,**  
(Successors to JAMES ANKERS)

**TIN-PLATE WORKERS, COPPERSMITHS, &C.,**

Britannia Works, BURY, near Manchester,  
Makers of every description of Tin, Iron, Zinc, Brass & Copper Goods,  
For Machinists, Cotton, Woollen and other Mills.



Tin Rollers for  
Ring Frames,  
Mules, Throstles,  
Winding and  
Warping Frames

We have made a  
speciality in Tin  
Rollers, knowing  
the importance of  
Machinists and  
Mill Owners hav-  
ing a good and  
true Roller to run  
the speeds that  
are now required.  
Our Rollers are  
made from the best  
sheets, and put  
together by very  
efficient workmen.

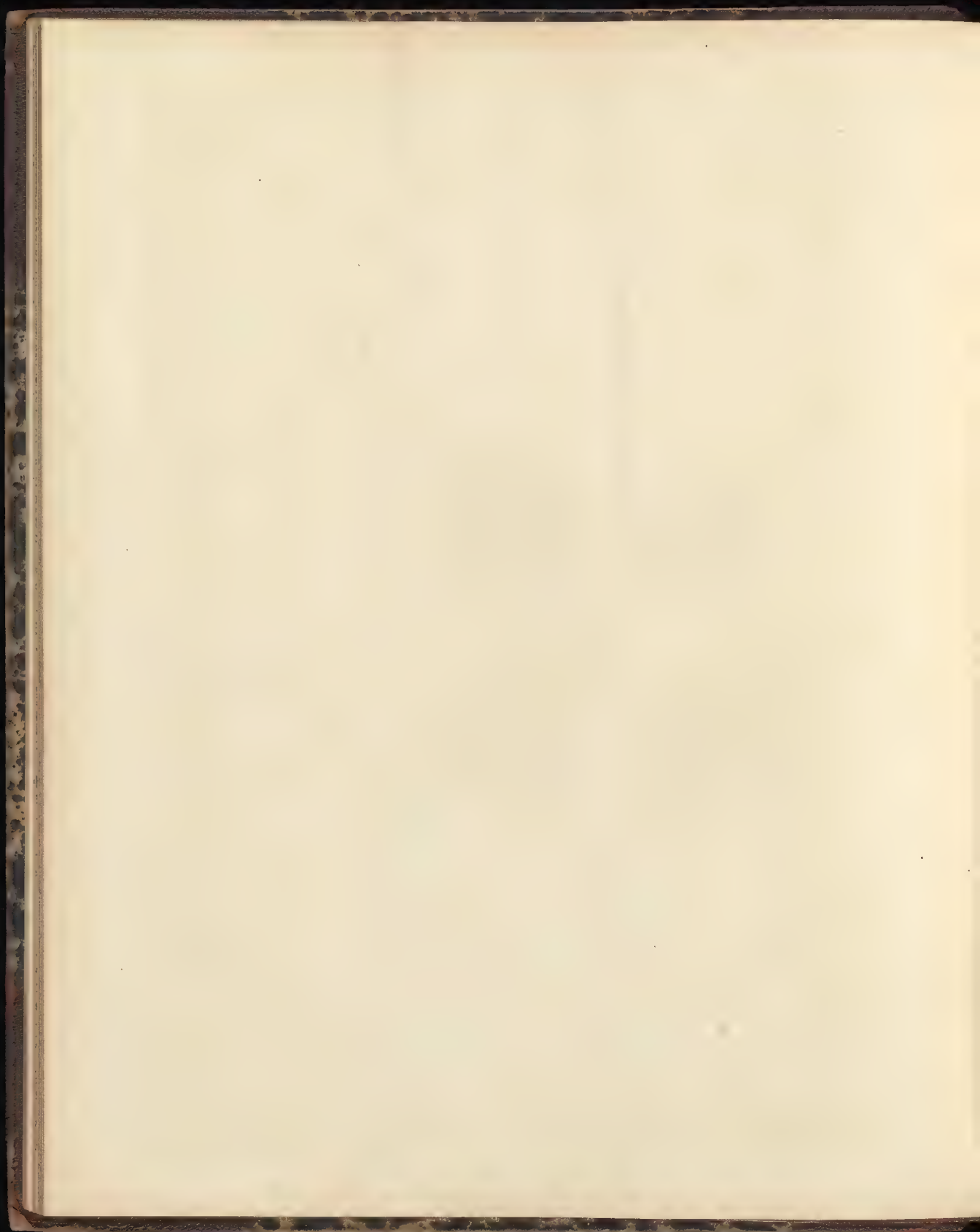
## LARGE STEAM DRYING CYLINDERS,

Any diameter up to 12-feet, and any length, either in Tin or Copper.

**SINGLE CASED OR CAVITY CYLINDERS** made on the most approved principle.  
ESTIMATES ON APPLICATION. REPAIRS PROMPTLY ATTENDED TO.



LACE CURTAIN.





PRINTED BLIND.

THE JOURNAL OF FABRICS AND TEXTILE INDUSTRIES.

12TH OCTOBER, 1888.

DESIGNED BY R. LORD.



BORDER FOR DRESS GOODS.

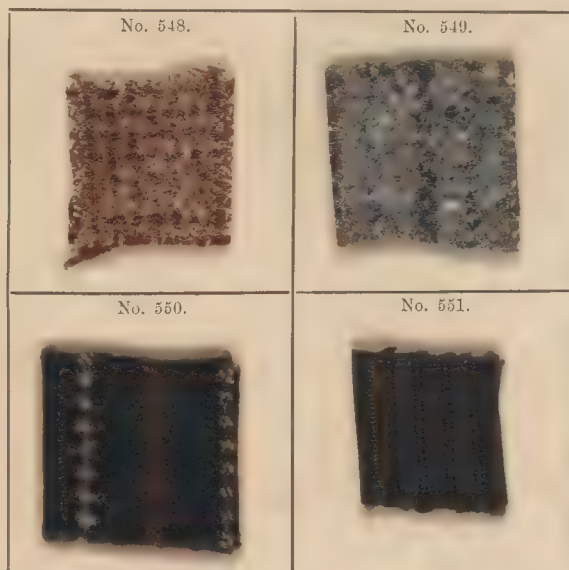
# SUPPLEMENT

TO

## The Journal of Fabrics and Textile Industries,

OCTOBER 12TH, 1888.

The following Patterns are Woven Specimens of the Designs given on Page 43.



DR. CLAYTON'S REGISTERED FABRIC TABLES, SCALES, WEIGHTS AND STEEL DIE, enable any person, and without calculations, to ascertain in a couple of minutes, from a small sample the size of half-a-crown, the weight per yard of any Fabric from 17 to 80 inches wide, as likewise the weight of warps and wefts therein. 10s. 6d. post free. Canada and United States, 3 dollars.—Postal Orders payable to H. & R. T. LORD, 10, Ann Place, Bradford, England.

5,104 ends in warp; 52 picks per inch; 11 healds; 13's slay, 3, 8, 8; 62 inches wide in loom; 56 inches wide when finished. Weight about 24 ozs.

of Bradford, for looms; Chubb and Sons, London, for locks and safes; and Merryweather and Sons, also of London, for steam fire-engines, plates, and appliances; and Mr. Lee Bapty, for the arrangement and decoration of the British Section.

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THE JOURNAL OF FABRICS AND TEXTILE INDUSTRIES.

12TH OCTOBER, 1895.

DESIGNED BY R. LORD.




BORDER FOR DRESS GOODS.

## FASHIONABLE \* DESIGNS.

## Mantle Cloth.

No. 548. Warp:— Straight Draft.



 2 ends Brown 20's, twisted to White 20's.  
 1 end Fancy twist.  
 2 ends Brown 20's, twisted to White 20's.  
 1 end Fancy twist.  
 4 times { 2 ends Brown 20's, twisted to White 20's.  
 over. { 1 end Claret, 10 skeins.

Woven as warped, with the exception of different colour of Fancy Twist.

1,200 ends in warp; 20 ends per inch; 20 picks per inch;  
4 healds; 2 ends in a reed; 10's slay; 60 inches wide in loom;  
56 inches wide when finished. Weight about 16 ounces.

## Woollen Suiting.

No. 549. Warp:—


 2 ends Black 16's, twisted to White 16's.  
 5 " Light Grey Mixture 8's.  
 1 end Black 16's, twisted to White 16's.  
 Design. 1 " Black 16's, " Crimson 40's.  
 1 " Black 16's, " White 16's.  
 1 " Black 16's, " Crimson 40's.  
 5 ends Light Grey Mixture 8's.

16

Woven all Grey Mixture 8's. Straight Draft.


1,178 ends in warp; 18 ends per inch; 18 picks per inch;  
4 healds; 9's reed; 2 ends in a reed; 66 inches wide in loom;  
56 inches wide when finished. Weight about 20 ounces.

## Woollen Trousering.

No. 550.



Draft.


 Warp:—16 ends Black, 2/22 skeins woollen.  
 1 end Tan, 2/18's worsted.  
 4 ends Brown, 2/22 skeins woollen.  
 1 end Tan, 2/18's worsted.  
 Design. 14 ends Black, 2/22 skeins woollen.  
 1 end Fancy twist.  
 1 " Tan, 2/18's worsted.  
 1 " Fancy twist.

39


Woven all Black Weft, 11 skeins.

2,178 ends in warp; 33 ends per inch; 32 picks per inch;  
9 healds; 11's slay; 8 ends in a reed; 66 inches wide in loom;  
56 inches wide when finished. Weight about 23/24 ounces.

## Worsted Trousering.

No. 551.

Warp:—


 3 ends Black woollen piping, 12 skeins.  
 3 " " worsted, 2/48's.  
 Twice. 1 end " woollen, "  
 3 ends Claret worsted, 2/48's.  
 1 end Brown woollen, "  
 Design. 2 ends Claret worsted, "  
 1 end Blue silk.  
 1 " Brown woollen, "

Pegged to fall.

Woven:—1 pick Black worsted, 2/48's.  
1 " " woollen, 12 skeins.

Straight Draft. Worsted pick over piping.

5,104 ends in warp; 52 picks per inch; 11 healds; 13's  
slay, 8, 8, 8; 62 inches wide in loom; 56 inches wide when  
finished. Weight about 24 ozs.

## New Patterns for Winter Season of 1889 and 1890.

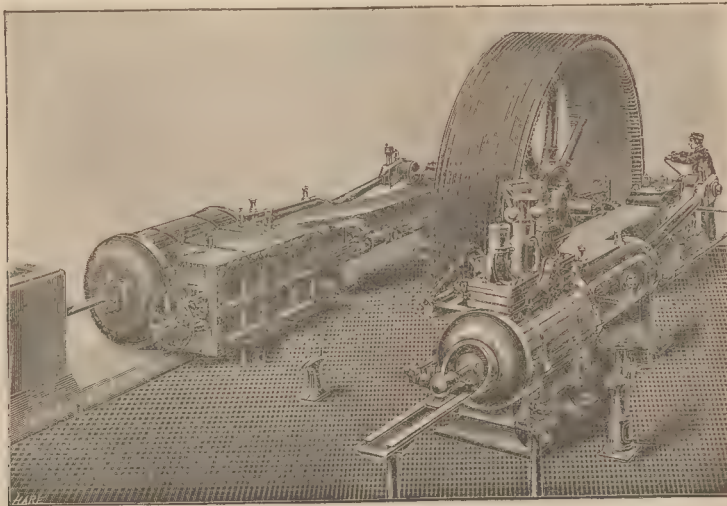
The new Patterns for the winter of 1889-90, which have just come into our hands, are, in some respects, a distinct departure from previous seasons. In the fancy descriptions of worsteds, which will, no doubt, have again a firm hold in various markets as a material both for ladies' and gentlemen's wear, there is a decided tendency to boldness in pattern, even when the fabric is made of the finest counts of yarns. For trouserings, stripes will be predominant, silk, in varied colours, showing up prominently in the design. Many of the patterns have broad stripes,  $\frac{1}{2}$  inch wide in one shade, the sides of the stripes having a contrasting colour in silk, or other bright yarn, these samples proving very effective, owing to the good design and colouring. Other specimens have the stripes in two or three different shades, with single threads of silk, of a colour which harmonizes with the shades, running up the sides of the stripes. In fancy worsteds for the coating trade, the patterns run more in checks, the tendency being also to bold patterns, these being formed mostly by raised ribbed overchecks, the samples being in more subdued shades than is the case with trouserings. In vestings, high colouring is the rule, but in this class there is little new to note. In the plainer classes of goods, the makers find it more difficult, season by season, to produce patterns which are distinct from those of former seasons, and, of course, these do not vary much from those produced twelve months ago, although there are some pretty effects in fabrics for dyed goods. This applies mostly to worsted of a smooth faced character. In the rougher classes of fabrics, some admirable patterns are before us for makers of coatings, mantle cloths, and such like goods. These have some entirely new yarns of a more fancy character than usual, the curl, which has had such a run being absent, and in its place thicker yarns, of the knopped style, spun in a generally soft or loose manner, are largely utilised. These yarns are mostly of a bright-haired character, and are used principally for making a decided pattern by being raised above the body of the fabric in large checks and stripes. For the mantling trade, they will, no doubt, be largely sought after, as the majority of the patterns are decidedly new, and are adaptable to the lower, as well as the better, classes of goods; in the woollen branches, the tendency is still to the rougher makes of cloth of the Cheviot class. In these, the colouring is generally of a high character, and in design the run is upon stripes for suitings, coatings, and trouserings, especially for the latter, although a large number of patterns run in checks of a broken nature. Fancy yarns are largely used in the different qualities of fabrics, and, judging by the continued advance made during the past two or three years in the finishing of fabrics containing fancy yarns, they are likely to have a run for some time to come. The yarns used are mostly spun in a soft or loose manner, and woven so that the cloths have a more or less elastic character. The general effect of this is to give the patterns a cloudy look. In the smoother faced cloths, there is very little fresh to note since the last season's goods were produced, these, especially the West of England make, showing but slight advance. In the use of colourings both for worsteds and woollens, it is evident that whatever shades of colour manufacturers use, judging by the patterns before us, they cannot adopt wrong ones, provided they are used harmoniously in order to prevent any undue prominence being given to any one shade. As usual, we shall keep on hand a stock of these patterns, which can be had in packets of 100 samples for £2. Manufacturers are requested to state as nearly as possible the description of patterns required, and to forward two or three cuttings of the texture of cloths they wish to produce.

The following is a list of those exhibitors in the British Section of the Brussels Exhibition who have gained the highest distinctions, viz.:— a diplôme d'honneur,—Apperley, Curtis and Co., Stroud, for woollen cloths; Macmaster, of Gifford, Ireland, for linen yarns; Holland and Sons, Manchester, for cotton yarns; and Rylands and Sons, also of Manchester, for grey calicoes and bleached shirtings; George Hodgson, of Bradford, for looms; Chubb and Sons, London, for locks and safes; and Merryweather and Sons, also of London, for steam fire-engines, plates, and appliances; and Mr. Lee Bapty, for the arrangement and decoration of the British Section.

## MACHINERY, &C.

### Compound Horizontal Fixed Engine.

We illustrate a pair of compound engines fitted with the Richardson and Rowland's patent automatic trip expansion gear, constructed by Messrs. Robey & Co., Lincoln, for driving a group of brush dynamos at the Glasgow Exhibition. The cylinders, which are both steam jacketed, are respectively 18½ inch and 30 inch in diam., with a stroke of 40 inch. Each cylinder is fitted with the trip valve gear, the cut-off on the high pressure cylinder being capable of being varied by the governor from nil to three-quarters of the stroke, whilst the cut-off on the low pressure cylinder is variable by hand while the engine is running. The engines are speeded to give 63 revolutions per minute, and transmit their power from a fly wheel 13 feet diam. by 12 ropes 1½ inches diam. Both high and low pressure cylinders have independent steam inlet and exhaust valves. The former consist of double beat Cornish equilibrium valves fitted to each end of a cylinder so as to get the shortest possible steam passage, thus, enabling the engine to work at all times with an initial pressure nearly approaching that of the boiler; those on the high pressure cylinder are under the direct influence of the governor. The exhaust valves consist of a special arrangement of Corliss's slide valve, which gives a quick wide opening to the exhaust with a very small travel; they are placed on the under side of the cylinders, so as to efficiently drain the interior and enable the pistons to work safely with the least possible amount of clearance. They are worked by eccentrics upon the horizontal shaft driving the admission valve gear. The working steam pressure is 100 lbs. per square inch, and the engines indicate 400 horse-power maximum. Following the action of the steam inlet valves, it will be noticed that the valves are lifted and released by trip levers, actuated by eccentrics, driven by a horizontal shaft, rotating at the



Robey's Compound Horizontal Fixed Engine.

same speed as the disc shaft, and running parallel with the engine bed. The length of time the trip levers are in contact, and consequent duration of the admission of steam into the cylinder, is regulated by the governor, thus automatically varying the grade of expansion to the work being done. The upper portion of the valve spindle is attached to an air buffer, which, assisted by a spiral spring, suddenly closes the valves when relieved from the trippers. A very precise action of the valve is obtained by this arrangement, and a very sharp cut-off is consequently insured. To prevent the valves being forced down too suddenly upon their seats, the usual air cushion is formed and regulated from the outside; this can be adjusted so that, while the valves close steam-tight, they yet come upon their seats with checked velocity. The governor regulating the admission valves is one of Richardson's patent spring governors, which, being relieved of all working strain, is so constructed as to give a wide range of cut-off with very slight variations in speed. It is driven by gearing also from the horizontal shaft driving the admission valve gear. The eccentrics are fixed upon a horizontal shaft so as to give a constant lead. The governor is supplemented by a Richardson Nevile electric regulator, which enables the engine to be controlled by the electric current itself, thus enabling a constant current, or constant E M F to be maintained with very varying loads. The valve gear is also arranged so that the engine can be stopped by merely pulling a cord carried to any part of the mill or factory, a provision which is invaluable in case of accident to life or machinery. The engine frames or bed plates are of the most solid and substantial character, efficiently resisting the direct thrust and working of the engine, thus securing complete rigidity between

the cylinder and main bearings, and efficiently taking up any strains in the crosshead guides, this design being altogether a great improvement upon the original type of girder engine as first introduced into this country. The bearings are of a very large size, made in three adjustable parts of Babbitts metal, fitted with suitable lubricators for continuous running. The steam, in passing from the high pressure cylinder to the low, enters a receiver super-heated by a current of high pressure steam from the boiler, circulating through a coil of piping placed inside it, thus raising the temperature of the steam previous to its admission into the low pressure cylinder. The receiver is, in addition, lagged with wood and sheet iron. Messrs. Robey and Co. are the sole makers of engines fitted with this gear, and they are made both single and coupled, high pressure and condensing—the latter, it is claimed, not using more than 15 lbs. of steam per horse-power per hour, whilst, owing to the almost total absence of friction in the valve gear, the proportion of useful work to indicated is much more than with most descriptions of valve gear. The coupled engines are made in various sizes, indicating from 50 up to 1,000 horse-power.

### Patent Backwashing Machine.

Messrs. Jefferson Bros. have given special attention to the improving of other machines besides the combing machine mentioned in the following notice. In their patent backwashing machine they have endeavoured to avoid the defects existing in those machines ordinarily in use, and in this they appear to have succeeded to a remarkable degree. We will endeavour to mention the chief points of the machine. In the first place, there are two sud bowls, each fitted with patent double-squeezing roller heads or single-squeezing roller heads, as the purpose for which it is to be used may indicate. There are patent drying cylinders which can be heated at once, and are tested to a pressure of 60 lbs. to the square inch. These cylinders have no glands or packing at the ends, nor is there any condensed water or buckets therein. As an important feature in these cylinders, and one which effects a great saving, we may state that those for single botany machines, which are 18 inches in diameter by 14 inches wide, only require 870 cubic inches of steam in each cylinder. The latter are constructed on what is known as the cavity principle. There are five of these arranged in two tiers, three at the bottom and two at the top, and each is fixed into the frame of the machine. The external surfaces of the cylinders are turned and finished smooth, and each is fitted with a jacket, and this part (not the cylinder) revolves. The cylinders are enclosed in cast iron doors. The condensed steam passes into a cast-iron economiser under the cylinders, and, by the aid of a fan revolving at 1,500 revolutions per minute, air is blown into the economiser, and, passing amongst the cylinders, the heat greatly assists in the drying process and prevents baking in the operation. Thus the wool comes out thoroughly dry and perfect in fibre. Messrs. Jefferson Bros. claim that, through the slivers passing under the cylinders and over the economiser, they can not only travel twice as fast as hitherto, but with better results. The machine has been thoroughly tested with the very best results, and the makers may congratulate themselves upon having a really important invention which cannot fail to give great satisfaction to all requiring an efficient backwashing machine. As above stated, we have not attempted a detailed description of the machine, but we have said sufficient to induce those requiring mechanisms of this nature to give the makers a call, and inspect them for themselves.

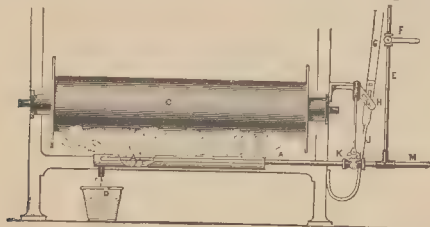
### Patent Wool Combing Machine.

Of all the inventions of our times, none has proved more important and valuable than those of the combing machine. Amongst the many mechanisms introduced, probably those most in favour are the Lister and the Noble Combs. As makers of the latter machine, Messrs. Jefferson Bros. have given their special attention to rectify and improve what they consider defects in important portions of its mechanism, particularly the dabbing brushes. In the old form of combing machine, owing to the teeth of the comb becoming hot, there was always the liability of the wool rising over the teeth when the machine was stopped, and upon its being re-started, the comb commencing a little before the dabbing brushes, the wool was drawn over the top of the comb, thus causing a mixture of top and noil. The dividers also acted later than the combs and caused slubs to appear in the sliver. The dabbing brushes acting together instead of having an alternate stroke was considered a defect, as it caused a great strain upon the machine, and, consequently, much wear and tear resulted. These disadvantages Messrs. Jefferson Bros. have contrived to overcome. By the aid of a new motion, the dabbing brushes are both driven by one strap, but the cranks being set at half centres an alternate action is secured. A further improvement has been effected in another important particular—the dabbing brushes are started at full speed before the combs begin their work, and, therefore, the wool is properly pressed into the pins of the combs, thus, every particle of wool is thoroughly combed, and the defect of mixing top and noil is avoided. Moreover, the dabbing brushes are reduced in size and, consequently, cost less, and, as they descend and rise more quickly

than hitherto, there is less wear and tear from the action of the combs upon them. The dividers are so arranged that, being started before the combs begin to revolve, the top cannot become doubled back, and thus slubby work is prevented. We have seen the machine in operation, and can testify to its accomplishing all that is claimed for it.

### Steaming Yarns during the Process of Weaving.

During the past few years, there has been much agitation in the cotton manufacturing districts against the excessive use of steam in factories, where certain classes of cotton fabrics are being woven. The yarns for these fabrics are made in such a manner that manufacturers insist on the atmosphere of the factories being more or less moist in order to facilitate the weaving process. This fact has been the cause of much agitation, as,



undoubtedly, this excessive humidity has had a very bad effect on the health of the weavers. As is generally known, steam has to be infused into the weaving rooms by means of jets from ordinary steam pipes, and, however objectionable the practice has hitherto been, manufacturers maintain that until some other approved method of damping the warps can be invented, it is totally impossible to produce certain descriptions of fabrics, unless the practice is continued. To supersede the method of steaming now employed, Mr. J. White, Ellis Street, Burnley, has patented an improvement which ought to meet the wishes of manufacturers generally, as the invention has considerable merit. It consists essentially in applying steam to each individual warp, in contradistinction to the usual method. Mr. White arranges a perforated tube in juxtaposition with each separate warp beam. Steam is conveyed by suitable pipes to each tube from the main pipe in the shed. To prevent the application of steam to the warp while the loom is at rest, a stop tap is arranged, and connected to the set-on motion, so that, immediately the loom is stopped, the tap is at once automatically closed to the entrance of steam. By this method, from 50 to 70 per cent. less steam is required than by the system now in use. All ventilators can be kept open in weaving sheds. The general arrangement of the pipes and mechanism can be seen from illustration, which is a back view of the loom. C is the warp beam, A is the perforated pipe from which the steam goes into a trough and then rises to the warp, M is a continuation of pipe A, to carry steam to a second loom. The upper portion of pipe E is connected with the main steam pipe at the top, and with pipe M and A at the bottom. G, H and J are parts of the mechanism for regulating and automatically stopping the supply of steam when required. Pipe A has a covering underneath to prevent the accumulation of fluff and dust, and also a trough to carry condensed steam into a bucket D. Mr. White will give full particulars of the cost, &c., on application.

### Wildman's Patent Bobbins, Pirns, &c., for Ring Spinning.

Various improvements in the making of bobbins, tubes, pirns, &c., have been made, the main object being their lightening and strengthening, and recently a patent has been taken out by Messrs. T. Wildman and Son, Caton, near Lancaster, for this purpose. It is well known that the generally high temperature of spinning mills has a very detrimental effect upon bobbins, in that it makes them more or less brittle, and the consequent wear and tear forms a considerable item in the expenses of these establishments, through the continued repair and renewals that are required. In the bobbins now under notice, the improvement is at once simple and efficient, as it reduces the wear and tear considerably, and ensures an important economy in mill expenses. The new method of making the tubes, pirns, and bobbins, which are especially suited for ring spinning and similar machines is as follows:—Brass or other metal hoops or rings of an improved shape, cut from solid drawn tubing, are inserted into the ends of the bobbins, &c., in order to prevent them splitting, the form of the rings being such that, after their insertion into the wood, they are not liable to slip out. It will be seen from the annexed illustrations how the



hoop or ferrule, which is of a conical shape, is inserted into the end of the bobbin, an annular groove being turned in the end of the tube, with the internal diameter of the groove slightly larger than the smaller internal diameter of the hoop. The hoop is forced into the groove with its narrower end foremost. The wood is compressed inside the ring and, after the passage of the smaller part of the ring, the wood springs outward again, and holds the ring so firmly that it cannot shake loose. The outside of

the hoop is conical in shape, with the smaller end of the cone at either the smaller or larger end of the internal cone; the outside may, however, be cylindrical. The effect of the improvement is that breakages are reduced to a minimum. The patented hooped bobbins have already been thoroughly tested by spinners, and pronounced by them to effect a saving upon those they have hitherto used. Messrs. Wildman and Son claim the following advantages for the patent:—The bobbins are rendered very durable, effecting a saving of 300 to 400 per cent.; the balance is perfectly maintained; the hoops are securely fixed, so that it is impossible for them to interfere with the working or shape of the bobbins. Being inserted in the lower end of the bobbins, they effectually prevent all expansion or contraction from the changes of temperature, to which they are frequently exposed.

### Lund's Patent Pulsating Pump.

The firm of Hulme and Lund have gained a wide reputation as engineers during the 15 years which they have been established, and, probably, their success has been mainly due to the thorough and efficient manner in which their machinery is made. In no branch is this more true than in the making of pumping mechanisms, which is a great speciality with this firm. These embrace every variety, from the smallest wall pump upwards. We may mention that this firm have just completed a pair of pumping engines capable of forcing 60,000 gallons of water per hour, raising it to a height of 480 feet. Neither have Messrs. Hulme and Lund been behindhand in



Patent Pulsating Pump.

other branches of engineering. Take, as an instance, the subject of automatic sprinklers, which, during a comparatively short space of time, have proved of the greatest importance in all factories. To be abreast with the requirements of the times, this firm are making a most efficient automatic fire engine to work in connection with sprinklers. However, our present object is not to enter into details upon the numerous and varied machines which they make, but to draw particular attention to their new pulsating pump, patented by Mr. Lund during the present year. As will be noticed from the small illustration, the pump is identical with that known as the pulsometer pump, the steam and water in the action of pumping coming in contact with each other. It is most simple in construction, while its adaptability to various purposes, combined with its portability, and what is of very great importance—its low price, place it in a position to gain the widest approval. There is no working part of any kind, reciprocating or rotating, except one valve; neither is there any intervening piston to keep in order, and, therefore, its simplicity will be easily recognised. The whole apparatus is contained in a single casting, consisting of two bottle shaped vessels having both inlet and outlet valves at the foot, connected respectively with the same suction and delivery pipes. The necks of the bottles being joined together readily admit of a valve and bush being inserted, the former is made of brass, and is cubical in form. The flat faces of the openings of the two bottles are each inclined at an angle of about 110°, thus being somewhat in the form of a V. When the valve lies on one side, there is a clear opening on the other for the passage of steam, and, on the valve being tilted, it falls upon the other side; thus there is a regular and intermittent supply of steam through the two bottles. The mode of action is as follows:—Steam is turned on and allowed to blow through the open bottle, and then turned off again. The condensation that takes place causes a vacuum in the bottle, and allows the water to rise and fill it, so that, when the steam is again turned on, it acts on the surface of the water, and forces it through the outlet valve, and away up the delivery pipe. When the bottle is emptied, the extra rush of steam that ensues causes the valve to tilt over and close that opening, at the same time opening the companion opening, and allowing the steam now to act on the water in the second bottle. Meanwhile, the steam left in the first bottle condenses again, forms a vacuum, and allows the water to rise in it once more, when the valve tilts over again, and the action is repeated. In this way, a continuous flow of water is maintained. We understand that this pump will force against a head equivalent to 100 feet. Messrs. Hulme and Lund's Engineering Works are in Dawson Street, Manchester.

### A Smoke Nuisance Case.

#### A SUCCESSFUL DEFENCE.

At the Manchester City Police Court, recently, before Mr. Fergusson and Mr. Baerlein, Messrs. George Hodgkinson and Sons, Princess Street, Manchester, were summoned for having caused a smoke nuisance at their premises on the 18th September last. Head inspector Rooke opened the case, and explained that an inspection of the defendants' premises was made on the 18th September, and that it was found that smoke was escaping to such an extent as to cause a nuisance. Inspector Hurst was called to prove that he made the observation, and produced his analysis, which showed that black smoke issued for 8 minutes, moderate 20 minutes, no smoke 2 minutes, in the course of 30 minutes, and he considered that this caused a nuisance. In cross-examination, the inspector stated that he was told that a new patent furnace by Messrs. Holden and Co. was being fixed to remedy the nuisance. Mr. P. A. Evans (for Messrs. Addleshaw and Warburton) appeared on behalf of the defendants, and admitted a technical offence on the date in question, but, before the proceedings had been instituted, his clients had done all they could to remedy the nuisance.

The defendants had mills at Bolton, and they had there in use for the purpose of consuming smoke a patent furnace made by Messrs. Holden and Co., which had been thoroughly satisfactory in its working, and, therefore, as soon as the defendants found that there were some irregularities in connection with the smoke at their premises in Manchester, they consulted Messrs. Holden and Co., and ordered a second apparatus to be fitted to their boiler in Manchester. Some delay, however, occurred before the apparatus was delivered, but it would be proved that it was affixed to their boiler on the 29th September, and had since been working most satisfactorily, so that no further difficulties could be anticipated. Mr. Evans suggested that it would be unjust to impose any fine upon the defendants, considering they had taken every means to comply with the requirements of the City Council, and asked that the case should be dismissed. Mr. J. W. Holden, of the firm of Messrs. G. H. Holden and Co., machinists, Manchester, was then called, and stated that his firm were the patentees and makers of the "Assisted draught furnace and smoke consumer." The defendants' manager came to them on the 30th August last, and mentioned that the authorities complained that they were creating a smoke nuisance, and he ordered them to fit up a similar furnace to that they had fixed at the mills in Bolton. The dimensions were taken without delay, but, in consequence of a large number of orders already in hand, the apparatus was not delivered until the 22nd September, and it was ultimately fixed on September 29th. Since that date, the furnace had been inspected, and had been found to work entirely satisfactorily. The witness, in reply to the Bench, stated that it would be impossible to secure more smokeless combustion than Messrs. Hodgkinson and Sons now obtained in their boilers. The Bench considered further evidence unnecessary, and dismissed the case.

### A New Gas Economising Product.

Various are the inventions in process for effecting economy to mill-owners and others. The latest of these, and one which should be hailed with much satisfaction, was brought before the notice of the public a few days ago, by the Lawrence Gas Company, St. Mary's Street, Manchester, who have secured patent rights for Lancashire and Cheshire, and, as the name of the company implies, has special reference to the lighting of factories and other places of business by the aid of a new gas economiser to which the company have given the name of gasoline. This is a bi-product from petroleum, and is a colourless, rapidly evaporating fluid. In its effect upon coal gas as an economiser, it has wonderful qualities. The method of application is as follows:—A vessel containing gasoline is placed in immediate contact with the ordinary gas-metre, and, through this, the gas, passes after leaving the metre, when it becomes so purified as to give a light of much brilliancy at a greatly reduced cost to the user. In fact, we are informed that an ordinary light is increased more than eight times in intensity, and, as an evidence of its economy, we may state that where one part of ordinary gas is mixed with three parts of gasoline, the saving to the user is 50 per cent. The company offer the new economisers to manufacturers and other users upon terms which should be considered exceedingly satisfactory. The machines and gasoline are supplied free, a stipulation being made that half the savings effected by the use of the economisers for the first year, based upon the average previous annual payments for gas, shall be handed over to the company, and afterwards, payment shall be a matter of mutual agreement. The company supervise the working of the economisers, so that all trouble is taken from users.

### Give the Belts Rest.

A writer in the *Practical Engineer* (Manchester) says an experiment was made as follows:—New leather belts, made from the same hides, were put on to two engine lathes, which stood side by side, and were used upon the same kind of work. One of these was thrown off every night, while the other was never released. The latter had to be shortened four times during its existence, while the other was taken up at once, and was in good condition when the continuously strained one was worn out. Of course, a single experiment of that kind would not definitely settle such a matter, but all experience seems to point the same way. It appears from general experience and experiments expressly made that the nature of the surface of belts and pulleys has great influence on the ratio of strain and resistance—that is on the slipping; but, contrary to expectation, a cast iron pulley, when turned smooth, gives no more chance for slipping than when it is rough. This is explained by the fact that the adhesion of the belt to polished smooth surfaces is as much a preventative against slipping as the friction of rough surfaces. In fact, it overbalances, in most cases, the roughness; and hence, knowing engineers place the grain or smooth side, (the hair side), and not the rough side (the flesh side), of the belts in contact with the pulleys, finding that there is more adhesion and a gain of thirty per cent. When we consider that rough surfaces, when in rapid motion, carry air with them, entrapped in their pores, and that friction depends, not on the amount of surface in apparent contact but, on the amount of particles of the surface in real contact, it is quite natural that smooth surfaces should produce more friction, when brought by pressure into close contact, than rough surfaces, of which it is

impossible to bring so many particles into contact, and which, besides, by their rapid motion, will entrap among the projecting points a separating, and, so to speak, lubricating stratum of air. A correspondent relates the following experience:—I once had occasion to drive a machine requiring about ten-horse power, and wished to belt from a pulley then running on the line shaft. I found the pulley was too small, and consulted several engineering publications, and found the size and speed given as ample for the purpose, when the fact was that under the conditions the belt would not drive three-horse power, nor are there any rules and formulas published that would fulfil the requirements in that case, which were as follow:—A line shaft passed through the basement of a mill, the attic of which was used for storage, and I wished to run a hoisting machine which had been worked by hand. The belt was required to pass up through the intervening stories, in which was no shafting, vertically about 60 feet to the hoister, but it was found, when an attempt was made to raise anything, that the increased tension of the working side of the belt would so slack the other side that it would slip or run off the lower pulley, the slack all being realized at the bottom. The belt was tightened as much as it would bear, with little variation in the result. A binder pulley against the slack side of the belt, near the bottom, remedied the difficulty.—*American Exchange*.

### The United States Tariff.

The bill prepared by the Republican members of the Senate's Finance Committee as a substitute for Mr. Mill's Tariff Bill, lately passed by the House of Representatives, has been presented to the Senate. It embodies an entire revision of the schedules and administrative features of the present law, while proposing the re-enactment of all such features as in the opinion of the draughters ought not to be changed. According to the estimates made by the Committee, the bill involves a reduction of revenue to the extent of about 75,000,000 dols., subdivided approximately as follows:—Sugar, 27,759,000 dols.; free list, 6,500,000 dols.; tobacco, internal revenue, 24,500,000 dols.; alcohol used in the lists, 7,000,000 dols.; and other reductions in Customs' duties, 8,000,000 dols. The classification of wools remains the same as under the present law. Wools of the first and second class, and all hair of the alpaca goat and other similar animals, is charged a duty of 11 cents per pound, and wools of third class, exceeding in value 12 cents per pound, a duty of 6 cents. Top stubbing and all other wastes, composed wholly or in part of wool or worsted are rated at 30 cents. All wools and the hair of the alpaca goat and other animals, advanced by a process beyond the washed and scoured condition, and not otherwise provided for or enumerated in the Act, are subject to the same duties as are imposed on woollen manufactures not specially provided for in the Act. On woollen cloths, shawls, and all woollen manufactures, not specially enumerated, of value not exceeding 40 cents per pound, a tariff is imposed of 35 cents per pound, besides an *ad valorem* duty of 35; of value between 40 and 60 cents per pound, a tariff of 35 cents, and an *ad valorem* duty of 40 cents; and of value above 60 cents, a tariff and an *ad valorem* duty of 40 cents per pound, which are also subjected to an ordinary duty of 40 cents and 40 *ad valorem*. Women's and children's dress goods, Indian cloths, &c., made partly of wool, the value of which does not exceed 15 cents a square yard, will be charged 6 cents per square yard and 40 *ad valorem*. Those containing an admixture of silk, wherein silk is not the component material of chief value, unless otherwise provided for, will pay 11 cents per square yard and 40 *ad valorem*, provided that all goods of the character enumerated and described in this paragraph weighing over four ounces per square yard pay 40 cents per pound and 40 *ad valorem*. Women's and children's dress goods and Italian cloths composed wholly of wool will be charged 11 cents a square yard and 40 *ad valorem*. All goods with selvages made wholly or partly of other materials, which have been introduced for the purpose of changing the classification for duty, will pay 11 cents per square yard plus 40 *ad valorem*, provided that all such goods weighing over 4 ounces per square yard pay 40 cents per pound and 40 *ad valorem*. For clothing, ready-made, not specially enumerated, all goods made on knitting frames and all pile fabrics, composed wholly or partly of wool, made-up or manufactured wholly or partly, the duty is 40 cents per pound and 45 *ad valorem*, and for cloaks, dolmans, jackets, &c., except knit goods, a duty of 45 cents per pound and 45 *ad valorem*. Endless belts or felts for paper or printing machines will pay 20 cents per pound and 30 *ad valorem*. The wool schedule makes a slight increase in the revenue.

*Kuhlow's Gazette* says—We are on the eve of a very important event, which will affect the railway traffic between Germany and the Orient. From authoritative circles in Vienna, we learn that great endeavours are being made to bring all the Orient lines into the union of the German Railway administration. Arrangements are being made for the official pourparlers, and it is expected that a decision will soon be arrived at.

### Consular and other Reports.

**MORE HINTS FROM ASIA MINOR.**—The most important industry in Asia Minor, we hear, is still, as heretofore, the manufacture of carpets, which afford employment to a great number of men and women in various parts of the country. In 1887, the exportation of carpets from Smyrna amounted to 2,000 bales, valued at about £84,110, which were principally shipped to Great Britain, France, and Holland. The most important centre of this industry is Ushak, especially as regards large carpets, but, unfortunately, the materials obtained by tearing up old carpets have of late years often been employed in this manufacture, so that these products are losing their reputation for durability. Carpets of fine quality, made with Angora wool, and known as "Filik," are produced in the little town of Kula. Gordes is also an important centre, and the carpets manufactured in this district are remarkable for their comparative thinness and density and often fetch as much as 30s. per square yard. The small Kirschehr carpets are noted for the purity of their dyes, and are mostly exported to the United States. There are also important cotton industries in Anatolia, where the manufacture of yashmaks has been resumed of late years, although the bulk of these is still supplied principally by Great Britain, and in smaller quantities from Switzerland. The light striped material called "Mohadjk Basma" is manufactured in Smyrna, and is much worn by the Turkish ladies in the summer season. Imitations of this material have been produced in Great Britain, but did not possess the peculiar texture of the Turkish tissue. Baladan supplies yellow striped turban stuffs; and fine shirtings, table cloths, and towels are manufactured in Magnesia. A peculiar cotton tissue, interwoven with broad green, yellow, and red silk stripes, and known in the country as "Beledieh," is produced at Tireh, and serves for making coverlets, divan coverings, &c. Silk lace and embroidery are produced in some of the provinces. The best specimens of the latter are highly prized for decorating furniture.

**ABOUT SILK IN MEXICO.**—The quantity of silk tissues imported into Mexico from Great Britain, Italy, Germany, France, and China, is increasing year by year. The principal demand is for plain black "gros grain," which is imported from France in pieces 70 to 80 metres long, and 46 to 60 centimetres wide, the piece varying from one to six piastres per vara. The descriptions most readily disposed of are the medium qualities, costing 2½ to 3 piastres. A large business is also done in satin damask kerchiefs for head covering, which fetch 12 to 24 piastres per dozen in the Mexican markets, and are at present mostly imported from France and Germany. Brocatelle for mantles is supplied by France and Italy, in pieces of 50 to 56 metres long and 50 centimetres wide, which are also sold at 3 to 8 piastres per vara, according as the material is made of mixed or pure silk. China crape is much worn in Mexico, and is manufactured in China, though imported from British houses. Silk lace handkerchiefs are obtained almost exclusively from France, and are offered at 2½ to 40 piastres per dozen, but qualities that cost more than 20 piastres form an exception. Plushes, with cotton wett, and satin are supplied by France and Germany, in pieces 35 to 40 metres long and 50 centimetres wide, and are sold in all colours—light shades, however, being preferred. There is also a great demand for damask goods and coloured taffeta for ladies; this branch of the trade is almost entirely in the hands of French houses.

**THE IMPORTATION OF SILK TISSUES INTO JAPAN.**—Although the manufacture of silk tissues has been rapidly developed in Japan of late years, a much larger quantity of European goods of this description was introduced into the country in 1887, than during the preceding year. The importation of satins with cotton wett amounted to 812,846 yards, as against 256,433 yards in 1886, the bulk, namely, 559,110 yards being imported into Yokohama. Germany has the largest share of this trade, and heads the list with 358,548 yards, followed by France with 276,729 yards, Switzerland occupying the third place with 104,784 yards. Although the importation from Great Britain was comparatively small, it showed the greatest increase in comparison with the previous year, when it only attained 8,745 yards. It is stated that the consumption in Japan in 1887 was nearly double what it was in 1886, and the stock which remained unsold on the 31st of December, 1887, was estimated at about 6,500 pieces, as against 3,000 pieces in 1886. The importation of light satin will, however, probably decrease, as the Japanese manufacturers are devoting their especial attention to this class of goods; but European stuffs of superior quality will be less affected by their competition, and may find a good outlet in Japan for several years to come. Besides mixed silk satins, Japan imports several other kinds of silk tissues from Europe, but in much smaller quantities. The customs returns for 1887 mention crape, 152 pieces; pongees, 16,535; pure silk satins, 2,846; mixed silk tissues, exclusive of satins, 440; and various silk stuffs, 6,066 pieces. The total value of the silk and mixed silk goods imported into Japan in 1887, is put down at 393,360 yens, or more than double what it was in the previous year. Besides Yokohama, which absorbs the bulk of this trade, Kobe, Nagasaki, and Osaka are gradually gaining in importance. It may be noted that although Germany supplied the heaviest item in 1887, its trade has remained almost stationary during the last two years.

### Electric Lighting in Marsden.

Mr. R. R. Cook, Beehive Mills, Marsden, has successfully applied the electric light in his works. The installation was started last week, and the lighting gave every satisfaction, being a steady, soft, and brilliant light. The plant consists of about 250 swan lamps of 16-candle power, suspended on neat flexible cords, with improved holder, and enamelled shade, and combined ceiling rose and cut-out. The lamps are fixed over the various machines, &c., in rows, each row being controlled by separate switch, which enables the lights being turned off when not required. These switches are of an improved type, mounted on non-combustible bases with black enamelled covers, and the mechanism is arranged so that the contact bar cannot be in any intermediate position. Safety cut-outs are provided for each section of lights and on the main circuits, besides one for each individual lamp. The conductors are made of 98 per cent. conductive by copper, and well insulated with India rubber, &c. All the wires are of ample capacity to carry double the quantity of current required on any circuit, and are laid throughout in wood casings. The lights are controlled direct from the dynamo room by means of special main switches, with double contact arms of a new and special design. The switch board is made of polished walnut, and, besides, the above is provided with voltmeter for testing potential of lamps, and all requisites complete. From this point, the engineer in charge has complete control of the whole of the lights, or separate circuits. The dynamo is of the well known "Crompton" type, driven by mill counter-shaft, and is capable of giving an output of 308 lamps of 16-candle power, and is working the plant at a speed of 900 revolutions per minute. The entire installation consists of the best materials throughout, and has been erected in first class style, and in strict accordance with insurance recommendations, and has been carried out by Mr. F. Acheson, under the superintendence of William Acheson, electric light contractor, 6, Hopwood Avenue, Manchester.



### ODDS AND ENDS.

The French Consul at Aleppo has forwarded to Paris a collection of specimens of the cotton, silk, gold and silver textiles now being manufactured in Syria. This collection, which is provided with full statements of price, &c., is now open to the public in the office of foreign trade, 80 rue de Varenne. After it has been exhibited in Paris, it will be sent round for inspection to the chambers of commerce and the commercial museums of the provinces.

A new textile fabric is about to be launched into commerce, produced by the seeds of the *Bohmara nivea*. The first crop has been so eminently successful that it is expected that the tissues of different fabrics to be woven from it will be ready before Christmas. The specimens of the tissues sent are scarcely to be called brilliant in colour, but are extremely soft and glossy, possessing the great virtue of distinction so much sought after by fashion now-a-days.

The French *Journal Officiel*, for the 10th August last, remarks that French merchants ought not to be indifferent to the growing necessity of protecting their market in Tripoli. England, moreover, is at present the only nation which imports cotton goods into the province of Tripoli, whether for local consumption, or to be forwarded into the heart of Africa. Hitherto, no other country has succeeded in supplying these fabrics, which form, by far, the most important and, indeed, essential article of commerce supplied to Tripoli from abroad, at anything like the same rate as Manchester does.

Commercial travellers who visit Sweden with the intention of doing good business in goods not manufactured in that country should bear in mind that they are now subject to a tax of 100 crowns for the first three months, and of 40 crowns for every succeeding month they stay in Sweden for business purposes. A penalty averaging from 100 to 500 crowns is attached to evasions of the tax, which is now rigidly enforced, and several cases have occurred recently, where commercial travellers who neglected to pay the tax, designedly or through ignorance, were fined from 200 to 300 crowns.

Messrs. Robert Hall and Sons, of Bury, who have already presented the Manchester Technical School Spinning and Weaving Department with two power looms for velvets and towels, have added to their generous gift the following preparation machinery:—One iron beam rack; one Sulby winding machine, showing various ways for winding on warpers' bobbins; one pirn winding machine for hanks, cops, bobbins, &c.; one 6-yards warping mill, with curved creel; one twisting-in frame. The textile classes are now in operation at the school in Princess Street, and it is hoped that the new premises will be opened for work, for day and evening students, at the close of this month.

# PATENTS.

## Applications for Letters Patent.

Automatic reversing mechanism for burl-dyeing machines. J. D. Asquith, Bradford.	25th Aug. 12,259
Automatically hanging fabrics on frames. T. Norton and G. T. Hellewell, Leeds.	12th Sep. 13,166
Automatic stopping for doubling and twisting. G. Josephy, London.	12th Sep. 13,190
Automatic anti-snarl motion for self-acting mules and twiners. D. Marsland, Manchester.	22nd Sep. 13,709
Bed for "jerries," "perpetuals," or cloth finishing machines. T. Clegg, Huddersfield.	3rd Sep. 12,690
Bleaching fibres by electricity. E. M. H. Andreoli, London.	12th Sep. 13,194
Belt fastener. F. B. Stanton, London.	25th Sep. 13,835
Card covered rollers for gig-mills. B. F. Byrom, Manchester.	24th Aug. 12,199
Cleaning hackle pins while working. J. M. Greeves and T. Lucas, Belfast.	10th Sep. 13,045
Cleaning hackle pins while working. J. Gordon, Ballymena.	13th Sep. 13,253
Change wheels for spinning. J. Winterbottom, Manchester.	14th Sep. 13,278
Cop reeling frames. J. Corrigan, Manchester.	26th Sep. 13,864
Cutting wool burs. H. L. Offermann, London.	27th Sep. 13,941
Dyeing, scouring, and otherwise treating fibres, yarns, and fabrics. W. Brown, Glasgow.	30th Aug. 12,485
Doubling frames, &c. T. H. Fallows, London.	1st Sep. 12,617
Drying and conditioning lengths of fabric before stentering in dyeing, bleaching, &c. J. S. Ashworth, London.	1st Sep. 12,618
Decorating woven material. T. Bills, London.	1st Sep. 12,630
Drag for looms. J. K. Caird and J. Stewart, Glasgow.	7th Sep. 12,922
Driving gear of self-acting mules. O. Schimmel, London.	7th Sep. 12,961
Dyeing, &c. W. E. Heyes, Manchester.	12th Sep. 13,175
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Driving pulleys. R. Hornsteiner, London.	17th Sep. 13,410
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Electrodes for bleaching vegetable fibres by electricity. E. M. H. Andreoli, London.	12th Sep. 13,192
Fixing card clothing to revolving card flats. H. E. Newton, London.	6th Sep. 12,909
Fabric for curtains, &c., and apparatus. L. Legendre, Mahieux, and Hennequin, London.	20th Sep. 13,594
Fabric for gloves. M. Wedlake, London.	20th Sep. 13,617
Feeding wool, &c. to carding and other engines. W. H. Greenwood and F. Farrar, Bradford.	27th Sep. 13,902
Feeding mechanism of Noble's and similar combing machines. W. H. Greenwood and F. Farrar, Bradford.	27th Sep. 13,903
Gig mills for finishing woven fabrics. E. Michaelis, A. Smethurst, and C. Wood, Manchester.	27th Aug. 12,229
Gassing yarns. B. A. Dobson and J. Hill, Manchester.	29th Aug. 12,430
Guiding, opening, and stretching fabrics. J. Hawthorn and J. P. Liddell, Manchester.	19th Sep. 13,514
Grinding rollers for grinding the "card wire" upon the "flats," "cylinders," and "doffers," and other "card wire" surfaces of carding engines. J. E. Platt and J. Fidler, Manchester.	27th Sep. 13,901
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Opening and cleaning fibrous material. T. and S. Buckley, London.	20th Sep. 13,588
Preparing vegetable fibrous material for obtaining fibre. J. Mactear, London.	3rd Sep. 12,682
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Slubbing, intermediate, and roving frames. J. Wood, Halifax.	31st Aug. 12,539
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Yarn winding. J. D. Whyte, Manchester.	26th Sep. 13,867
Yellow, orange, and brown colours of alizarine-like properties. T. R. Shillito, London.	27th Sep. 13,920

## Patents Sealed.

4,245	8,775	10,016	10,386	10,729	10,946	11,155	11,275
11,332	11,355	11,441	11,615	14,092	1,424	2,627	4,817
6,476	7,410	7,453	9,232	10,076	10,861	11,520	11,507
11,677	11,812	11,880	11,952	12,374	13,868	7,575	7,587
7,683	7,734	7,796	11,717	11,850	11,851	11,891	11,899
11,911	11,929	11,946	11,973	11,976	12,024	15,774	15,892
3,606	6,643	6,649	7,945	8,003	8,137	11,311	12,142
12,209	12,231	12,368	12,463	12,506	8,419	8,591	8,633
8,667	8,661	10,930	11,154	12,459	12,567	12,568	12,602
12,612	12,641	12,662	12,603	12,754	12,760	12,762	12,776
12,849	12,859	16,403	2,011	5,453	5,806	6,235	6,319
8,826	8,924	8,932	8,984				

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# The Journal of Fabrics

AND

## Textile Industries.

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### Notices.

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### Washing and Treatment of Raw Wool.

BY JOSEPH FALKENBACH, U.S. CONSUL, BARMEN.

(Continued from page 38).

Although good progress had been made in loosening the greasy staple through this squeezing process, which is still resorted to in small woolen mills, many improvements had to be introduced before the desired result was gained. A repeated soaking in fresh water and a second pressing between the rollers produced a more favourable result, so that, by degrees, the present "Leviathan" machine, a combination of soaking vessels and squeezing contrivances, was arrived at. The construction of the "Leviathan," and its treatment of wool, is as follows:—The first square soaking vessel receives the raw wool, which remains a greater or lesser time, according to its quality, in warm water or weak lye. After the wool has soaked long enough, the spreader or elevator is set in motion, raising the wool on the first endless lathe-table, which conveys it to the first pair of rollers. Immediately behind this pair of rollers is the second soaking basin, into which the squeezed wool falls, and, having gone through a second washing, is carried, by means of iron hooks, through the washing bath to the front part of the basin. Here the second elevator is waiting for the wool, which it carries through the second pair of rollers into the third basin, filled with a fresh lye-bath. In the same manner, the wool passes through a third, and, in some cases, a fourth, basin, till it is finally freed entirely from all greasy and sticky substances and is ready for the rinsing machine, in which the adhering lye and soap-suds are washed off with cold or warm water, according as

the wool is of short or of long staple. The three-basin system is the one most generally employed, and is sufficient for all practical purposes. Leviathans, however, with two, and even four, basins are also employed. The strength and method of preparing the scouring lye depends entirely on the nature of the wool. It is quite impossible to conduct the washing of the wool on any fixed plan or system. Favourable results can only be obtained by practical experience. Buenos Ayres wool, for instance, is generally treated with a bath of the following compounds:—In the first basin the wool is soaked in lukewarm water without any washing ingredients, on account of the fact that all the wool sheared in the grease contains, as a rule, potash enough to saponify the greatest portion of the animal grease. In the second, third, and, eventually, fourth basins, soda, urine, or soap is added in such quantities as may be required by the character of the wool, in order that it may be freed from the last remnant of grease and dirt in passing through the rollers. The real inventor of this automatic washing machine and its systematic combination we must undoubtedly consider Eugene Melen, of Verviers, who took out a patent for the first "Leviathan" on the 14th day of April, 1863.\* In the course of time, the original motory mechanism has undergone various modifications and improvements, the principal aim always kept in view being to save, as much as possible, the staple of the wool. Owing to the quiet and steady motion of the hooks and rakes which carry the wool through the bath, an entanglement of the fibres is not easily caused. The elevator, however, which conveys the wool from one basin to the other is still a considerable source of danger. When the wool, which is passed through the basin as slowly as possible, reaches the elevator, it is suddenly jerked out of the water by the lades of the latter. A part of the wool thus caught up often slides down again from the lades into the whirlpool, which their violent motion causes to be again seized and drawn out upon the endless latticed conductor. As this lifting out and sliding back again of the wool repeats itself more or less frequently, the danger of twisting and knotting is very great. To obviate this whirlpool caused in the washing fluid, and the falling back of the wool from the elevator, the most varied means have been essayed. The best system was that displayed in operation by Messrs. McNaught, a Rochdale firm, in their "Leviathan," exhibited at the International Wool Exhibition in London, in 1881. The form and arrangement of this "Leviathan" were the generally known ones; new and peculiar, however, was the lifting apparatus which was constructed as follows:—Over an obliquely-lying polished glass plate, reaching from the sieve bottom of the basin to the rollers, and falling off in an obtuse angle toward the same, were two rake-shaped frames, the single shafts of which were placed side by side in alternate order. These shafts were provided with metal prongs, which reached almost to the glass plate, and were united by short connecting rods with the diagonal rods, which in their turn connected uprights, placed side by side, with sliding pieces arranged further below under the glass plate. The latter lay close to the eccentric rods in alternate order, and were raised and lowered by the latter and by the rake-shaped frames. The eccentric rods were placed upon symmetrically turning shafts. The sliding pieces were connected by means of guiding rods with the oscillating lever, so that the latter, together with the frame, preserved an oscillating motion. The shape of the eccentric rods kept the frames, by means of close and half-rotation alike, in the lowest and highest position, while the taking off and letting down were quickly performed. When the frame was in its lowest position, the wool was shifted upward along the glass plate; in their highest position the frames moved out downward far below the plate. The effect, therefore, is easily understood. The last rake conveyed the wool toward the frames, the sinking frame pierced the wool with its prongs, and (in the lowest position) forced it along the glass plate in an upward direction, and, while throwing off the wool, the other frame returned in the meanwhile to commence the same operation over again. At the upper end of the glass plate, the wool was thrown over the edge and fell along the second glass plate toward the squeezing cylinders, whence the wool was either carried into a second basin or thrown by a flap roller from the lower press cylinder to accumulate on the floor. The working of this machine was very exact, the velocity of the rollers, as also of the frames and rakes, being moderate, was a favourable augury for the preservation of the staple. By the use of glass plates all friction in lifting out, and, consequently, the knotting of the wool were avoided, and the wool came light and open to the press cylinder. The lifting apparatus was simply contrived and worked well. In the "Leviathan," so far as it is adaptable for scouring purposes, we have an almost perfect washing machine. In connection with the "Leviathan," a cold water rinsing machine is often seen, the motory mechanism of which is similar to that of the scouring basin, only that the velocity is much greater. \* \* \* \* Before concluding these remarks on wool washing, it must be mentioned that all experiments in the direction of scouring wool with easily-volatile, grease-dissolving, compounds have ended in practical failure. As the industry progressed, it became necessary to ascertain, in the sanitary interests of the community, how it could be made possible to purify the waste water resulting from the washing and rinsing processes from noxious impurities, so that it might be allowed to run off into adjoining canals and rivers. In some cases, industrial establishments have been compelled, by protests raised in the neighbourhood, or by official acts, to cleanse their waste water.

\* This is inaccurate. See remarks on Petrie's machine.—EDITOR.

In consequence of this, the manufacturers developed the idea, not only of rendering their water conformable to sanitary conditions, but of converting it into a source of profit. In many industrial establishments, considerable profit is derived from the wool scourings. After a certain quantity of wool has been scoured and rinsed, the remaining hot and cold waters, which contain potash, grease, and soap-suds, are run off into a large water-tight vessel placed outside the wash room; lime water and sulphate of lime are added, whereby soap of lime and ferrous soap are formed, which sink to the bottom of the basin. After standing twelve hours, the water appears at the top perfectly clear and free of all noxious substances, and can safely be run off into the neighbouring streams. The greasy substances left in the vessel are formed into cakes in filter presses, and dried by a mechanical process. By the application of benzine and acids, the soap is freed from the lime and ferrous compounds, while the remaining grease is utilized in the manufacture of wool-wax, stearine, paraffine, oleine, degreas (oil used in tanneries for chamoising), illuminating gas, &c.

#### MESSRS. JEFFERSON BROS.' WOOL WASHING MACHINE.

In the above article by Joseph Falkenbach, much praise is given to the Leviathan machine. There are, however, other wool washing machines in the market, and some of these claim particular attention on account of some special feature which assists in rendering them of extra utility. The invention of Messrs. Jefferson Bros., Brownroyd, Bradford, has special features, and claims a share of attention. In this machine, the usual forks are used for moving the wool forward whilst being washed, but the ordinary feed motion is dispensed with. There are three rollers, the lower one being under water, whilst the second is partially immersed, therefore, the wool floats quite evenly in an expanded state between the second and bottom rollers, where it receives what is called the wet nip. From thence it passes through the top and second rollers, where it receives the dry nip—that is, the wool is squeezed entirely above water. It will, therefore, be easily seen that the feeding motion is dispensed with, that the wool is squeezed twice, and at the same time is lifted out of the water. This particular arrangement may be altered slightly, according to varied requirements. Such, for instance, as what is known as the hand-washing process. This short reference to Messrs. Jefferson Bros.' machine should not be omitted in the account of the washing and treatment of raw wool.

#### PETRIE'S WOOL WASHING MACHINE.

There is another wool washing machine which well deserves special mention, namely—the one made by Mr. John Petrie, Jun., River Street Works, Rochdale. Mr. Falkenbach, in the above article, attributes the first successful invention to Eugene Melen, of Verviers, who took out his patent in 1863. This is quite inaccurate. The first inventor of a successful automatic washing machine was Mr. John Petrie, who obtained a patent for his invention, dated 11th January, 1853, or 10 years before the date of Melen's patent. As early as 1854 Messrs. Titus Salt and Sons, Saltaire, were supplied with machines by Mr. Petrie, made according to his patent. Subsequent inventions and improvements may be said to have their basis upon that patent. In entering upon a short description of the machine as now made, we may say that the rakes are specially arranged so as to deal with long, short, or delicate, wools, with equally successful results. They are of the greatest strength, and are so balanced as to require very little power to work them. Then there are brass false bottom plates and hopper bottom plates provided with outside outlet valves, adapted for taking away the sand and mud without carrying off any of the fibres of wool; this operation is accomplished in the smallest possible time. The patent slide and delivery rake overcome all difficulties in getting the wool to the nip of the rollers. The width of the lifter is nearly the width of the squeezing rollers, and thus an equal and uniform feed is secured to the nip of the rollers, and further, the lifter is so short that the wool is carried to the squeezing rollers immediately, full of the scouring liquor. Being thus presented to the nip, the discharged liquor carries with it loose particles of dirt or foreign matter which may still remain in the wool, and which cannot be so well disposed of after the wool has been conveyed upon a long conveyor or lifting apparatus. All the working parts are placed outside the bowl, giving ready access and increased durability to all the wearing parts. This patent lifter can be fitted to any wool washing machine. The nip of the large squeezing rollers is as low and near to the level of the scouring liquor in the bowl as practicable. The bottom roller shaft revolves immediately above the level of the liquor. By this arrangement, the journals are kept entirely free from sand and dirt. The press is very strong, and has all the latest improvements for taking the weight off the rollers when not in use. The rollers are weighted by compound steel levers, and can have any pressure from 10 cwt. to 15 tons, applied to them. A noteworthy feature in connection with these is that the top roller is made of clean cloth compressed upon the shaft, giving great elasticity, and allowing ample material for wearing. Compared with rollers wrapped with sliver, the cost is very considerably less, besides the great saving in the time usually lost in frequently re-wrapping. The great elasticity of the rollers covered with "compressed cloth" presents an equally good and effectual squeezing surface, while their durability reduces the cost to a mere trifle compared with their using sliver. The

average durability may be stated to be three years, whilst the extra cost would be saved in less time than a year. These are a few points which will doubtless repay careful consideration by manufacturers. Judging by the number of well known firms who are using this machine, we should say it accomplishes a large amount of work in the shortest space of time, and also does it satisfactorily.

#### A NEW METHOD OF WASHING WOOL.

A new invention comes from Adelaide, South Australia, which, it is said, is to completely revolutionize the method of washing wool. This invention is not the outcome of one mind, but is a combination of ideas emanating from Mr. Moritz Wolff Judell and Mr. Ignatius Singer. The first of the machines is now being made by Messrs. Mather and Platt, Salford Ironworks, Manchester, for the firm of spinners in Halifax, of which Dr. Bowman is a distinguished member. We recently had an interview with this gentleman, who expressed himself in the highest terms of praise of the invention. Dr. Bowman is well known as the author of valuable works, amongst them being "The Structure of the Wool Fibre." In Lecture III. of this work, there is some interesting reading on the washing of wool, in the course of which it is stated that (page 161) "Disulphide of carbon dissolves the suint and fat of wool very easily and completely without injuring the fibre." This disulphide of carbon is the agent used in the operation of washing by the new machine. Attempts have been made before in this direction, which hitherto have failed, but it is anticipated that, in the present case, success has been attained. Hot water and the use of soaps are dispensed with. Dr. Bowman gave as his opinion that the present method is wrong, and that the defects are owing to the use of the water heated to a somewhat high temperature, whilst it should never exceed 60 degrees; also to the use of injurious cleansing agents and, lastly, to the continual tumbling of the wool by the action of the forks upon it. In the new machine, these defects are overcome. We are to see the wool perfectly washed and, whilst the deposit—such as sand, &c.—leaves the machine at one side, a pure oil, manufactured ready to hand, comes away at the other. Such is the information we were able to gather from our interview with Dr. Bowman, who intends, upon the completion of the machine—in about two months' time—to give a lecture upon it before the Society of Dyers and Colourists.

#### Hints on Practical Designing.

BY J. C. GOODFELLOW, HAWICK.

During the present century, there has been great progress made in the art of designing for textile fabrics. The art of weaving, while it embraces design in its simplest form, is yet as distinct from that higher art known as designing as is the art of the common mason or bricklayer from that of the architect whose mind has conceived and worked out the structural details of an ornamental building. As a pretty general rule, the weaver works to a plan furnished him by the designer, and, in so far as design is concerned, has almost as little relationship to it as the machine whose movements he either actuates or guides. In the process of weaving, the worker may recognise the features of design as they are developed before him, but, in the majority of cases, this causes no other feeling than that of satisfaction at the progress made, when such is likely to meet the approval of the foreman. It is only as a quantity of labour done that the weaver looks on the cloth as it passes from the front of the loom and is wound on to the cloth beam. A very great deal could be said or written on the different kinds of designs that are applicable to textile purposes. Designs may be worked either of large or small size in some kinds of fabrics. In linen, for instance, will be found almost all sizes, from the small bird's-eye pattern to the large and beautiful picturesque reproductions, such as are made in Coulson's factory, at Lisburn. One thing that must be noted with respect to nearly all linen goods is the fact that the material being all of white or whitey-brown colour, any design must be entirely due to the interweaving of weft and warp threads alone; in other words, the design must be a woven design, and not owe its appearance to any other cause than the ability of the designer to so interweave the warp and weft. This is also the case wherever, in the warp and weft, the same self colours are used, no matter what the fabric may be. Hence it is that silks and satins present such a glistening appearance. The weft threads, which are much softer in their make than the warp threads, cause the design to show much better, whether it be a small twill or a large figure. In woollen coatings and trouserings of self or solid colours, which are out bare by the Yankee so that the crossings of the warp and weft threads are easily distinguishable, it is always desirable to have a small pattern, whether twilled or figured. In coatings, this is especially the case, and the smaller the figure and the finer the twill, the more likelihood there is of the goods being in demand by the general public. This, at least, is the experience of salesmen and travellers, and has been for the last thirty years. Of course, there has been a good deal of change during that time in several classes of goods, but, in the coatings and self trouserings that are still made, this feature is very discernible. In coloured goods, quite a different set of ideas and results have been in vogue. Here we have the colourist competing with the designer proper, not merely in the

selection, but in the production, of patterns. It may be observed that many designers are merely colourists, with a very scant knowledge of the capabilities of interweavings which the loom, as a textile machine, can produce. This is very frequently the case with masters or employers, who, while they may have passed through the various stages which go to the manufacture of cloth, have yet done so in so very imperfect a manner as to have failed completely in gaining a full or perfect knowledge of the various processes necessary to produce the finished goods. When we consider the number and variety of these processes, we see at once that it is quite impossible for any one person to have such a knowledge as will enable him to determine what the result will be of a given kind of work. But, while a person may only have a very superficial knowledge of the processes which the finished cloth has had to go through before it is ready to be sent off to the merchant, it is yet quite possible that he may have a good knowledge of the class of work when in the finished state, and be able to tell whether or not it is likely to meet with approval from the buyer, or command a ready sale in the open market. It is because of this imperfect knowledge of the ways in which cloth is made, especially in the weaving process, that many employers expect their foreman designer to produce unattainable results. For instance, it is almost impossible to produce a thick, firm, cloth, made of fine yarn of high counts. In can only be done by weaving double or treble cloth, and, in these cases, the fabric, while it may gain the requisite thickness and weight, can not have the firm close grip of one woven of heavier yarns, such as celio or plain will give. The variety of designs, or rather appearances, otherwise called patterns, which can be produced when two or more colours are used, is almost without any limit, and is so practically. When we consider the shades of grey mixture, made by mixing even black and white wools in proportions, we see at once that a much wider field is open to the pattern designer than could be obtained by any combinations of purely black and white yarns. The boldness and distinctness, always the main features in patterns made of self colours, are entirely absent, and a subdued kind of appearance takes the place, which is much more pleasing to the eye than are the oftentimes staring effects otherwise produced by self black and white combinations—especially when such are made in patterns either stripes or checks of larger size in the warp than two threads of black and two of white alternately, with either a black or a white weft if a stripe, or two picks of white and two of black alternately if a check. In a hair-line pattern, which is the only possible one in plain cloth, when the warp and weft is one of black and one of white alternately, the appearance is so much subdued by the close proximity of the two self or solid threads to each other as to have almost no objectionable feature. When bright wools—such as scarlets, yellows, greens, blues, &c., are mixed with either blacks, browns, or whites, in the carding process, so as to produce other shades of mixtures, an immense and agreeable variety of materials is provided for the designer, who, if at all equal to the occasion, ought to be able to so select, combine, and otherwise adapt his yarns to his ideas as to produce patterns that will meet the requirements of the market. Of course, along with mixtures such as those indicated, it would be well to use solid or self colours, as well as twisted yarns of dissimilar kinds, such as black and white, black and yellow, black and blue, and also twists lighter in colour, such as white and yellow, white and scarlet, white and blue, etc. It may be remarked that these high or bright-coloured twists ought, however, to be used sparingly, as too much fancy colouring is as likely to injure a pattern by its exuberance as the want of fancy colouring is to detract from the goodness of a pattern. When, however, to the abilities of the colourist, the designer adds a thorough knowledge of the various processes of interweaving warp and weft, there cannot fail to be produced effects in textile work such as must meet the taste and desires of the most fastidious of the outside public. In its higher aspects, design in textile fabrics is as much the result of genius and talent as are the works of the artist in painting or in sculpture. In the silk woven book marks of Coventry, in the linen table-cloths of Lisburn, in the brocaded goods manufactured in Lyons, and in carpets, whether Brussels or Kidderminster, we perceive the art and abilities of designers embodied. And, although the material is of a kind more subject to the decaying influences of time, and less likely to meet with the virtuoso who will take reverent care of samples worthy of preservation, yet, in reality, many of the textile productions of the present age are as worthy of being preserved as the statues of Ancient Greece, or the violins of Cremona. Textile productions are, however, made as much for use in our daily life, whether as household or personal necessities, as for adornment or show, and, as a necessary consequence, require to have the elements of durability in wear, as well as of beauty or excellence in appearance. It is in the perfect union of these two qualifications in textile fabrics, that the art of the designer is principally shown, more particularly when we consider that, owing to the great competition which exists in the market, for the question of price enters so largely into that of production. For a considerable number of years past, trouserings and coatings have been made without any marked design in so far as figuring is concerned. Colouring has had more to do in the production of stripes, checks, marled, and mottled goods, than actual weave in design. There is, however, at the present time a slight tendency to return to figured cloth, at least when the figure is not too prominently shown. A class of figured cloth which was very much in vogue about 30 years ago, might, with great advantage, be introduced at the present time. If it is made of self

colours in the warp and weft, the figure will show clearly and distinctly, but any designer can modify the effects by varying the colours or shades of his materials. The following are the particulars of the class of cloth to which reference is here made:—



Plan Pegging.

Warp:—1 end Black, 20 skeins.  
1 " White, "

Weft:—1 pick Black, 20 skeins.  
1 " White, "

16 healds.

Straight over Draft.

28 picks to go over pattern in weft.

1,672 ends in warp.

44 " per inch.

42 picks "

16 healds.

11's slay.

4 ends in a reed.

38 inches wide in loom.

28 inches wide when finished.

Clear finish.

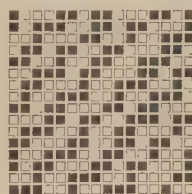
Weight about 12 ozs.

The following is the design which will be shown on the face of the cloth, in distinct black and white, with the above combination of warp and weft, and pegging as given above:—



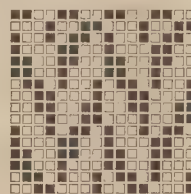
This design is repeated four times in order to show better.

It may be remarked that, in the weaving of double cloth designs, the figure which appears on the face of the cloth is the same as that of the design, and, while the pegging for the dobby or witch machine may also be called the design, it is only that in so far as it is part of the details in the production of the figure, which is the real design or idea underlying the weave of the cloth itself. If the designer wishes to make a six quarter width of cloth, he must double the number of ends, or nearly so, for cloth woven 76 inches wide in the loom will not so easily mill in to 56 inches, as cloth woven 38 inches in the loom will mill in to 28 inches. There is always a tendency of the side selvage to shrink in more than the inside of a piece. I here give another pegging and design for the same class of weave:—



Plan Pegging.

Woven in 16 healds. Straight over  
Draft. 16 picks to go over pattern.



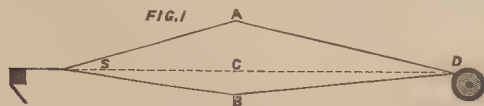
This Design is repeated four times to show better.

## Elements of Good Shedding.

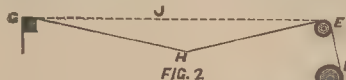
BY METIER.

It goes without saying that "shedding" is one of the most important motions in either hand or power loom weaving. It not only touches the ornamental character of the fabric, but it relates to the construction of the texture produced. There are some points in the formation of a good shed which are not so generally understood, or recognised, as affecting the weaving of a substantial, evenly-made, cloth. For instance, whatever the class of shedding arrangement employed, steadiness and rigidity of movement should be secured. An unchangeable condition in the making of a fabric, stable and uniform in structure, is a minimum vibration of the several parts of the loom compatible with the requisite changes to construct the texture. Flexibility in the shedding gear results in the formation of an irregularly sized shed—the shafts not being elevated and depressed with that exactness which ensures the production of a firm fabric. Lever movement is always desirable in actuating healds, while spring or weight gearings are, for reasons that will subsequently be explained, objectionable. By the use of the first of these contrivances, positive action is secured, that is to say—providing the parts are connected together with mechanical accuracy and precision—the shafts, however diverse the sheds may be in arrangement, will be raised or depressed uniformly; one point will thus invariably be attained when elevation

takes place, viz., the maximum height, and, when reversion occurs, the opposite point of the shed, viz., the maximum depth, will be attained. Unless there is the most exact movement in the mechanism of the shedding arrangement, and the whole is controlled by levers, and not by spring gear, these two extremes of the shed are liable to vary, and, as a result, produce a fabric slightly uneven. The finer the goods, the more perceptible are defects due to this cause in the woven article. Coarse cloths, in some instances, might not suffer either in uniformity of texture or in appearance from this lack of exact motion in the shedding apparatus, but it cannot, on this account, be passed over as a minor detail, for the tendency is, especially in worsted textures, to produce cloths of the finest structure and manufacture, and nothing less than a loom perfectly uniform in action can facilitate the production of these goods. Another important feature of a properly arranged shedding gear relates to the method of opening and closing the shed. This movement, though rapid, should be gradual—slow at the commencement, quick at the terminus. One speed throughout applies more strain on the warp than is necessary to form the shed. Of course, the threads cannot be separated, and elevated and depressed, without some extra tension being applied to the warp; but one system of opening the shed may increase, while another system may decrease, the tension applied, and thus minimise the liability of breaking of yarns. Some kinds of materials are known to weave better, or with more facility, in one make of loom than in another. Why is this?



Is it not because one principle of shedding puts less strain and friction on the chain yarns than another? Experiments conclusively show that, when the shed is formed on the system of one uniform movement, the most tension takes place. The cause of this is not difficult to explain. Before a shed commences to be formed, the threads of the warp are at rest and in one common line. Now it will be evident that if, in disturbing the yarns, they are suddenly and abruptly lifted or depressed—we might say automatically jerked into other positions or pulled out of their normal line—and if they were fairly tight before being operated upon, there will be a tendency to fracture them. The smaller the yarns, the tenderer they are, and the greater the injury produced in the warp by this system of shedding. So that we advocate a gradual increase in the speed of the shedding gear during the process of opening the warp yarns for the reception of the shuttle. A simple experiment, which may be carried out by the reader, will illustrate the advantages of the latter method. Take a thread of two-fold 30's worsted and fasten its ends to a level surface, drawing it to a nice degree of tightness. Gradually lift it from the centre, marking the height at which it breaks. Next, treat a yarn of a similar count and fixed at the same tightness by suddenly and rapidly elevating it, when it will be found that it breaks before it reaches the point to which the other yarn was drawn. In this illustration, the former method of elevating the thread is the one that should always be



adopted in the loom, while the latter method should be ignored. From this, we learn that the makers of fine goods ought, in selecting looms, to closely inspect the principle of the action of the shedding contrivance, for the best cloth will, of course, be made by that motion which frictions the warp to the least extent. Another essential of easy and good shedding is positive movement. There are shedding motions which are so constructed as to lift the healds by positive mechanism, but to depress them either by weights or springs. These arrangements are not calculated to give the best results. A true shed should have all the threads in the warp, whether up or down, of one degree of tightness. This is scarcely feasible when the healds are depressed by the above appliances. Especially may a variation in the tension of the threads be observed when weights are the depressing agents. They simply hold the shafts down, and do not depress them. Fig. 1 will illustrate the defects of this arrangement. In this sketch, D is the yarn rest, A a thread of warp lifted, B a thread of warp depressed, and C a horizontal line drawn on a level with the warp rest, and the extreme apex of the shed, or point S, where the two series of threads are divided from the cloth. From this diagram it will be evident that when a shedding motion only elevates, it operates unevenly on the warp threads, causing those which are lifted to be tensioned more excessively than those which are depressed, for they are drawn further from the level of the yarn rest and breast beam. Thus, in such a motion, threads A being a further distance from C than B would necessarily be tighter, and hence result in the production of a fabric perceptibly firmer on the upper than on the lower surface. In an accurately formed shed, the distance travelled by the threads when elevated should identically correspond with that travelled by the yarns when depressed, ensuring uniformity of tension on the warp. This is a position of threads which

can only possibly be obtained by employing a shedding arrangement which operates from the warp line, and is, as a consequence, double in action—both lifting and depressing the healds simultaneously. All the best constructed looms are, as we may point out in future articles, built on this principle. The defects of the system of shedding sketched in Fig. 1 may be partially remedied by hanging the healds at such a height that the base of the shed A will be practically the same distance from line C as B. Single lift jacquard machines have, for a similar reason, the mails of the harness hung slightly lower than the warp rest and the breast beam. Fig. 2 shows this plan of gaining the requisite regularity of tension on the warp in such machines. The mails of the harness in this method are so much at an angle, with a horizontal line drawn from the warp rest E, to the cloth rest G, as to form a depth of shed equivalent to that obtained between line J, and the highest point of the shed when the threads are lifted. Sketch 2 explains the position of the yarns when the healds or harness are hung in this manner before the shed is formed. Point H represents the mails of the harness. On the shed being produced, some of the threads remain at rest in the position shown, while others travel, not merely to the line J, but to a height slightly more than the distance of H from J, so that, when the shed is fully open, the tension of the warp threads is quite uniform. The question of open and closed shedding must not be passed over without some detailed explanation. In reality, all shedding arrangements may be classified under these two heads. Each system has its advantages, but the open shed is coming largely into use, and may ultimately entirely supersede its contemporary for certain branches of the trade. On this principle, when changing the sheds, the shafts travel direct from the top to the bottom positions and vice versa. This is not the principle in closed shedding. Here the movement is compound. Providing that a shed is open in this loom, and it is required to change it, the shafts would first be brought on to one level, or the shed would be closed, those threads which were up falling, and those which were down rising to a central line; this done, the healds that are going down would travel to the bottom position, while those that are ascending would reach simultaneously the top position, when the new shed would be complete. The motion is evidently two-fold—the shafts travelling first from the top to the centre, and then from the centre to the bottom of the shed, or, if rising, the process is inverted. That this system frictions the warp more than open shedding, an illustration will show. In weaving a hopsack, four picks in a shed, on the open principle, the shed once formed remains unaltered for four shoots in succession, the parts of the engine not being actuated through the loom picks as required. The same number of shoots in a closed shedding apparatus would be controlled by the following changes:—For the first pick, the shafts would travel from the centre to the top, and from the centre to the bottom positions in forming the sheds, then the movement would be reversed in closing the sheds. Though the second, third, and fourth, shoots are exactly the same as the first, the movements here indicated would take place in the formation of the respective sheds. The extra strain and friction that the closed shedding motion puts on the warp threads, as well as the merits of the two systems, will be treated of in a future paper.

### Technical Education in Relation to Textile Industries.

On Friday evening, October 19th, Mr. Roberts Beaumont, M.S.A., Lecturer in the Textile Industries Department of the Yorkshire College, Leeds, gave an address on the above subject in the People's Hall, Galshiels. Mr. Thomas Owens, Deacon of the Manufacturers' Corporation, presided, and there was a large attendance. The following is a condensed report of the lecturer's address, which occupied about an hour and fifteen minutes in delivery. If Egypt, the cradle of so many utile handicrafts, may lay claim to having been the birth-place of the loom; France to having supplied to the weaving industry the most capable mechanism for producing figured fabrics; Germany to having increased the multiplicity of shades used in textile manufactures; and England to having invented and constructed the finest and best equipped machinery for converting wool and other fibrous materials into yarns and cloth; Scotland may boast of being the indigenous soil of the great tweed industry, which, in points of magnitude and importance, is comparable with any branch of textile fabrication. The pure, unadulterated Scotch tweed, with its soft, warm, and cosy touch, its strength and elasticity of build, its tasteful and elegant colouring, was a fabric which it was to be hoped would ever be produced in the woollen centres of this country. Whatever might be done with re-manufactured filaments in imitation of Scotch tweeds in other centres, he trusted Scotch manufacturers would, on no account, so adulterate an article regarded by merchant and purchaser as constituted of wool pure and simple. No permanent blemish would result to the tweed trade from reducing the quality of the excellent texture, of which the future depended on the purity and soundness of the wool used in its production. Considering the requisites to produce a woven fabric like this article, perfect in structure and finish, and neatly decorated with colour and pattern, the apathy with regard to technical education was somewhat surprising. The art ought to have a place in the curriculum of subjects treated of in institutes established for giving instruction in the applied sciences. One encouraging symptom was the expressed demand of the operatives for facilities of obtaining such know-

ledge as was accessible to their French, German, Belgian, and even American contemporaries. In a centre like Galashiels, there could not be a doubt regarding the beneficial influence which an efficiently organised textile class must have upon the trade of the district. There, as elsewhere, a troublesome minority might think technological classes were simply media for conducting from one factory to another secrets of the trade, but did such secrets exist? The spirit of the times decided that knowledge, whether scientific, literary, or technical, was the free property of the masses, hungering and thirsting after its acquisition; sealing up knowledge in particular industries only obstructed the development of trade. Technical knowledge had for its object the culture of that manipulative skill which taught its possessor to mingle in his employment brain-work with hand work, theory with practice, intelligence, and manual dexterity. These qualities were all necessary in employees to make them competent mill operatives. The operative in a factory should not only receive instruction in the department in which his special work lay, but should have also some knowledge of the preceding and subsequent operations in which his was one link. This would enable him to do his part better. Some persons opposed to technical institutes argued that, as the country had got on well without them in the past, so could it in the future; but the competition of the present day was unknown in the past. Foreign countries were endeavouring to supplant our manufacturers in the markets of the world. The question was—how shall we maintain our position? If the remedy was not to be found in technical instruction, he asked where was it to be got? Technical instruction went directly to the heart of the difficulty. The ordinary experience in a factory was a safe instructor, but it was slow in operation, and might never reach the laws and principles concerned in any branch of manufacture. Experience would be more valuable to one who had received a training in the technicalities and principles of his craft. But by experiment and tuition in a technical school, both principles and methods could be imparted more accurately, and in an incomparably shorter period of time than in a factory. Anyone who knew what weaving was would admit this, and it applied to all branches of techniques in which the students were taught along with experiments. Going into detail on what the terms 'technical education' really meant, Mr. Beaumont remarked that there were difficulties in giving full instruction in textile art that did not occur in the case of some other arts. It had not yet been fully systematised, but it had done very much to improve matters. The schools had turned out students with intelligence to extract what was valuable for their purpose wherever they saw it, whether in the factory or elsewhere. A weaving school should give such instruction as would tend to improve the manufacture, appearance, finish, and design of the textiles made in the district in which the school was situated. The system of teaching should lay hold of every detail connected with these results, but at the same time it should teach the general principles of weaving as an art. The basis was a good ground-work on which to set up the details and specialities in which the locality was more immediately concerned. The weaver and designer would be better qualified in their respective lines if they knew something about the nature of yarn, and other matters connected with cloth manufacture—each specialist in one line could not know too much of the principles concerned in the other lines of the manufacture. The spinner should know something about the nature of machinery, and the chemical composition and other characteristics of the raw material he had to convert into yarn. An efficient system of technical instruction in the textile fabrication involved a knowledge of the properties of the raw material used. A knowledge of wool lay at the core of successful manufacturing, and the study of the properties of the various wools used could be made very interesting to pupils in technical classes. A good deal of science was required to put the wool through its first stage in manufacture—scouring, for unless this was well done, the colour, soundness, and elasticity of the fibre might be destroyed. The blending of wools was so important a matter that it should be under the direct supervision of a trained technologist with a natural talent for colour combination, and conversant with relations of colours. Particularly in mixture cloths were mellow and tasteful blending of shades required; soft, neat, yet expressive combinations were sought after, or a pattern which did not so much represent a patchy, as a rich, tinted appearance. Every colour employed should be in perfect harmony with the others, and thus compose one indefinite blend of minute effects. In Scotch tweeds there was every facility for the production of novel and rich styles by the display of skilful and original ability in the blending process, so that this subject should be taken up in any course of instruction given in a woollen district. Instruction should also relate to the manner of amalgamating the various fibres and colours of wool in the carding process, so that when spun the filaments would be equally and uniformly distributed throughout the length of the thread. Yarn construction was an important process, but he could not go into full detail on the subject. Its several stages presented a field for investigation and experiment, and, unless the work were well done, much that was new and excellent in design and handle of woven fabrics could not be realised. Designing and weaving, probably before all other branches, ought to be explained by the teacher of textile art. These branches gave to cloth its texture and ornamental element. They gave great scope to fine taste and inventive genius. The main thing wanted was cloth that was pleasing to the eye and soft to the touch. The principles of weaving could be taught, apart from practice on a loom, but the best course was to give theory along with practice. Theory alone could not

possibly result in any tangible success in such a pre-eminently practical art as manufacture. Too frequently the shaping of educational courses in designing and weaving were of such a description as to be inapplicable to mill requirements. As the teaching of theory proceeded from lower to higher stages, so should the testing of theory by experiment accompany it all through. The best way to approach the purely technical subject of woven pattern, was, in the first place, to lay a foundation in the elements of cloth construction and weaving. In discussing colour as an element of textile art, Mr. Beaumont said it was a most intricate subject. There were differing opinions as to what constituted harmony in colourings, one accepting combinations as neat and pleasing, while another thought they were strong and vulgar. The taste and standard of a manufacturer might differ from those of a merchant, and that of a customer from both. This was a practical difficulty that designers had to face, and want of success in the market was no proof that designs were not in good style of art. Students could, however, be taught to judge pretty accurately of the purity of colours, but that would not give them a power of combining colours harmoniously. Some individuals had an instinctive power of discriminating the best combinations, and when they were trained scientifically they became experts in textile art. The subject thus hardly admitted of exact teaching, but the attention paid to it might advance knowledge of it ultimately, and also improve the national taste for good combinations. If the subject was to be treated of to any purpose in our textile laboratories and class rooms, it must be taken in hand by one practically conversant with the manufacture of woven goods. After remarking on the wonderful machinery in woollen factories, Mr. Beaumont said that by training the workmen to put mind and thought into his handicraft, an inestimable boon was conferred upon him, and much of the hum-drum was extracted from factory life. Those so trained would exhibit in their work a more refined taste and executive ability than those whose sole knowledge was acquired in the mill. They would make better managers, and this would help the development of trade. Some thought that, having attained supremacy as a manufacturing nation, the glory of Britain must decline, but there was no fear of that if the technical knowledge required was widely imparted to our operative classes.

### The Manufacture of Two-Colour Yarns and Fabrics.

Hitherto, threads of worsted yarn of various colours have been manufactured by twisting and doubling together threads previously dyed to their respective shades or colours. It was impossible to manufacture fancy threads of two colours from raw yarns twisted or doubled before dyeing, because, in the latter process, they were both equally coloured by the dye and, therefore, received the same shade of colour. The object of an invention recently patented is to obtain, in a single dyeing operation, the effect of a two coloured thread by the combination of a raw fine cotton thread with a raw worsted yarn thread. It is well known that fibrous materials differ in their relative dispositions to take or to absorb colour, and the operation resorted to in order to produce the requisite tint depends upon the material it is desired to dye. This combination of two threads of different material admits of varied effects being produced by one or more dyeing operations. When a twisted or doubled thread of this description is dipped in the bath intended for dyeing wool, the cotton is not dyed, but its colour remains the same, whilst, when it is dipped in the "cotton" bath, the wool may not be dyed at all, or it may receive a different shade of colour. For instance, the dyeing of the combined thread in a bath of black dye would produce a black and white thread; the colour of the cotton can, therefore, be varied at will by dipping it in a bath of the required dye, while the colour of the wool remains unaffected, the process required for dyeing wool being generally different from that required for dyeing cotton. It is of importance to employ only fine cotton threads in this combination, because the fine "numbers" are always uniformly spun, and this facilitates the production of an almost perfectly homogeneous thread. Wool threads, on the contrary, cannot be spun uniformly throughout, and the result of this is the formation of thick and thin places in the thread. If woollen threads variously coloured are twisted or doubled, the thread produced by this combination presents corresponding irregularities, which are, of course, more or less noticeable in the woven fabric. Instead of dyeing the combined thread and then weaving it, the fabric may be first manufactured from the combined raw white thread and subsequently dyed, or, these combined threads may be woven in combination with other threads. The difference between the effect produced by the fancy yarn, as hitherto manufactured, and that produced by the yarn made in accordance with this invention is very striking.

**INTERMEDIATE SHADES.**—From reds we pass to Bordeaux, browns, and such shades. These are dyed with logwood, fustic, alizarine, aniline, and azo colours, with the addition of various mordants. Red woods should be got rid of as they injure the wool; felt it, and they are removed from the yarn with difficulty. An artificial fast red can be more advantageously employed. After boiling with chromic acid and oil of vitriol, very fast shades are given, which do not bleed into the whites and leave the wool open.



## ORIGINAL DESIGNS.

On our first plate, we give a design for a Counterpane, drawn by Mr. R. T. Lord, 10, Ann Place, Bradford.

Our second plate is occupied by a number of designs illustrating an article on page 54, on the Weaving of Gauze Cloths. It also contains a design for Worsted Suiting, particulars of which are given on page 55.

On our third plate is a design for a Brussels Carpet, drawn by Mr. F. Layton, York Terrace, Akroydon, Halifax.

## MONTHLY TRADE REPORTS.

**WOOL.**—There has been a marked improvement in the Bradford districts during the month, the effects of the recent failures in connection with the district having been to clear the air, and to give a feeling of more stability to the trade generally. Wool, as regards prices, has had a hardening tendency, and the demand, although only for actual consumption, has been good. The yarn and piece branches have improved, and, in spite of the fact that orders have not been large in bulk, they have been rather numerous, and where old rates have been accepted, which has been the exception, good orders have resulted. Dress materials in new patterns have sold freely, and, generally, a healthy tone has pervaded the market, whilst the outlook for the future is cheering.

**WOOLEN.**—With the exception of the trade in overcoating cloths, the woollen market has kept about as last month. The recent mild weather has had its effect upon the sales of the heavier makes of cloth, and new orders have, in consequence, been difficult to secure. The worsted branch, especially in fancy goods, keeps busy, and, as manufacturers of this class are now making exceptionally effective patterns for next season, an improved demand is expected. In woollens also some good styles are being prepared, the result being looked forward to with the full expectation of a more than average demand. The lower qualities have sold fairly well during the month, this branch of trade keeping up well month after month. Generally, manufacturers of most descriptions of goods have kept pretty well employed, many in the fine worsted branches having run overtime for some weeks past. Prices, on the whole, keep tolerably firm.

**LINEN.**—A much better feeling has pervaded the markets during the month, and an improved business is expected shortly. More inquiries have been made for table linens, toilet covers, towels, tea and other cloths, of a fancy nature. In the plain descriptions of goods, trade has been about as last month. The demand for flax has improved, and prices have had an upward tendency. The jute trade has kept up well, the demand having been steady at firm rates.

**LACE.**—The usual dullness, which has been the feature of this trade for months past, has characterised the markets during the past month. With one or two exceptions, in which novelties are the feature, trade has been very quiet in all branches, and even novelties hardly pay for the extra cost of production, prices being at a very low ebb. The prospect of an improvement in the lace trade seems remote, and manufacturers generally are despondent about the existing state of the industry.

**COTTON.**—The position of both spinners and manufacturers was, during the past month, a rather unenviable one. In the face of rising prices and scarcity of the raw material, they were, in the majority of cases, unable to procure a corresponding increase in rates for their productions, and, consequently, numbers of looms were stopped, and this had its effect on the spinning industry. The quantity of yarns disposed of was below the average, and the sales of cloth suffered accordingly. The demand for export to the East has been quiet, that for the Continent has also been rather restricted, and buying for the home markets has been done with much caution. Orders on hand are being speedily worked out, and spinners and manufacturers are rather anxious for the immediate future, as they find working at the present rates out of the question, for, in addition to dear cotton, they are also handicapped by the recent rise in prices of coal and other materials used in the cotton industries.

## Weaving Gauze Cloths.

In making gauze cloths, the average student finds considerable difficulty in dissecting patterns. In the following notes, illustrated by a few figures, some ideas are given as to the best method to follow. (*The Figures will be found on our second separate plate*). Fig. 1 is a plan of the appearance of a gauze cloth when looked down upon, or when one gets what is generally termed a "bird's eye view." When carefully examined, the student will find that two threads are crossing around two more, from right to left, and the next set of four threads are crossing at the same time, but in the opposite direction. He should notice carefully the interweaving of the crossing threads, and of those crossed round, so as to find upon what heald he can work them. If he consult the draft (Fig. 2) he will find that the crossing threads are drawn through the first and second healds, passed under the third and fourth ends, and through the doup, the next set being drawn through the same healds, but in the opposite direction, so as to correspond with the plan of cloth. The threads drawn through the third and fourth healds work plain, except on the gauze picks and the pick preceding and following the gauze picks; this is done to allow the gauze pick to be more clearly defined, as it is a well understood rule in gauze weaving that, to have a clear crossing, the crossing thread must be raised on the pick preceding the gauze pick, and also on the pick following it; then, having got the draft, he should next determine how the healds will have to be raised, and to do this he must examine the plan and draft together. Taking the first pick of the plan, he will see that the crossing threads only are raised, and these are drawn through the first and second healds, therefore, on the design (Fig. 3) the first and second are dotted to lift. Following the same order throughout, he will be able to trace each pick in succession, and he will find that the doup is only raised for the gauze picks, and is indicated on the design by crosses. Of course, the same result could be attained by lifting the doup in place of Nos. 1 and 2, and *vice versa*, but it is always best to lift the doup as seldom as possible, so as to save wear and tear. Another important factor must not be overlooked, and that is, that whenever the crossing thread is lifted, whether by its own heald or by the doup, the loose half or slip must be lifted, otherwise, breakage in the yarn will occur. A very pretty effect can be got with this pattern, with the following particulars:—

Crossing threads 24's Blue cotton.  
Plain " 30's White "  
22's reed, 4 ends in a reed, alternate reeds missed.  
1 pick 24's Blue cotton.  
6 picks 30's White "  
3 " 24's Blue "  
40 " per inch.

Fig. 7 is a similar pattern, with three sets of 2 crossing 2, and one set of 1 crossing one, arranged to produce a checked effect by having a square of plain surrounded by gauze, and would make a good pattern if woven as follows:—

12's reed.  
8 reeds, 4 ends in a reed, 1 reed missed.  
1 reed, 2 " 1 "  
48 picks per inch.

Another good effect might be got by having the two gauze picks, and the ends, 1 crossing 1, a different colour from the body of the check. Fig. 4 is a plan of a figured gauze pattern, woven in a douped harness, and tied up to have 2 ends crossing 2, as shown in Fig. 6—the douping plan. In weaving a pattern of this kind in a harness, we should require 5 hooks for 4 threads, and so arranged that each set of 4 ends has a separate doup. This is accomplished by setting apart the front row of hooks for douns, the principal difficulty being in the slackening arrangement, as, being a figured cloth, the douns are never all raised at the same time, so that, if all the crossing threads were on the same slackener, some would be eased when required, and those not required would choke up the shed and cause stitching. The difficulty is generally got over by having the crossing threads passed through two hooks, one being as much below the other as the shed is deep, and, when the doup is raised, the extra hook is also raised, and gives off sufficient length to allow the doup to draw the crossing thread underneath the standard, and the extra hook has a weight attached to draw it back again when the strain is released. In making designs for this class of fabric, the hook carrying the doup is not shown on the design paper, but when required to lift is marked on the same threads as Nos. 1 and 2 of the douping plan in a different colour. In the design (Fig. 5), the squares of weft are put on as though the douns had no existence, and then they are surrounded by plain, so that, when the gauze joins up to the figure, it will form steps in the plain, and leave the figure perfect. In putting in the gauze working, the doup should be raised first, and should be raised immediately before the figure begins, if only for a single pick, as, if the figure begins after Nos. 1 and 2 have been raised, a float will occur, and also a leno cross—that is, a half or imperfect gauze crossing. The doup is shown on the design in crosses. A good cloth for the above figured gauze is—

2/80's worsted warp and weft.  
84 ends per inch.  
4 " in a reed.  
64 picks per inch.

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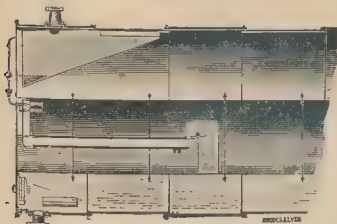
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Among the advantages secured by this Furnace are the following:—

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- Secures absolute prevention of smoke.
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In describing the working of the **HOLDEN FURNACE** on Four Lancashire Boilers in London, Perry F. Nursey, Esq., C.E., Ex-President of the Association of Engineers, states in "IRON," of July 6th, 1888, that:—"The coal used is **HARTLEY MAIN**, a **CAPITAL SMOKE PRODUCER**, but, on firing up the Furnaces, all that could be detected was some **THREE** or **FOUR** **SHORT PUFFS** of **VERY FAINTEST BROWN SMOKE**, which the Smoke Abatement Society would probably have designated **No. O. SHADE** of their scale, **FOR IT CERTAINLY DID NOT REACH WHAT WE HAVE SEEN DESIGNATED AS THEIR No. 1 SHADE.** A **70 LBS. STEAM PRESSURE** was not only easily maintained, but **HAD NOW AND THEN TO BE KEPT IN CHECK, AS IT MADE THE RUN TO 76 AND 78 LBS.**

"The **ASSISTED DRAUGHT FURNACE** is simple in construction, does not necessitate any radical change in the Boiler, and requires no skill to work it. **WE CONSIDER IT TO BE A RATIONAL AND PRACTICAL METHOD OF DEALING WITH THE PROBLEMS WHICH IT HAS SUCCESSFULLY SOLVED.**"

The "**PRACTICAL ENGINEER**," of August 17th, 1888, says:—"The combination of regenerative heating of the air supply with the perfect regulation of draught **ENABLES THE EVAPORATIVE EFFICIENCY OF THE BOILER TO BE DEVELOPED TO ITS FULLEST EXTENT, WHILE IT SECURES, AT THE SAME TIME, PERFECT COMBUSTION AND ABSENCE OF SMOKE.**"

Messrs. **G. H. HOLDEN & CO.** are also Makers and Patentees of all kinds of Winding and Twisting Machinery for all Fibres, which may be seen in operation at their Exhibition Rooms.

**CARR STREET, BLACKFRIARS STREET, MANCHESTER,** FIVE MINUTES' WALK FROM VICTORIA AND EXCHANGE STATIONS, AND TWO MINUTES' FROM THE EXCHANGE.

# J. H. RILEY & CO., BURY, near Manchester.

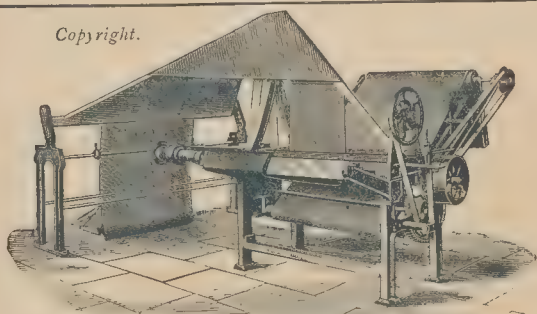
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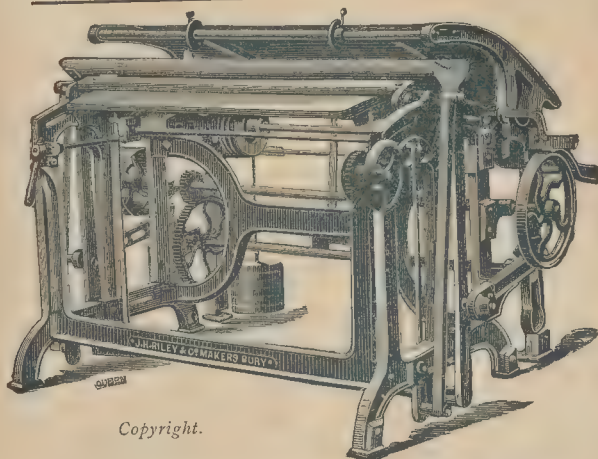
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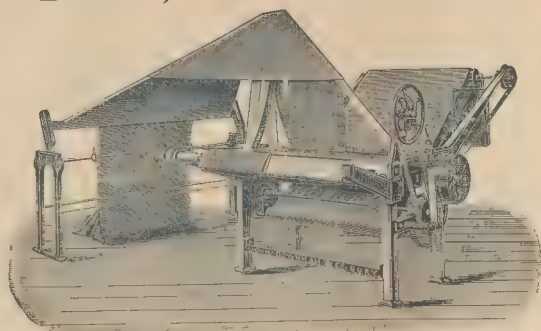
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For Single and Doubled Woollens, the best and strongest Machine made.  
We have some scores of these machines at work.

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**ELDER'S RIGGING MACHINE,**  
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For Doubling all kinds of Woollen and Worsted Goods lengthwise.

**IMPROVED CUTTLING MACHINES**  
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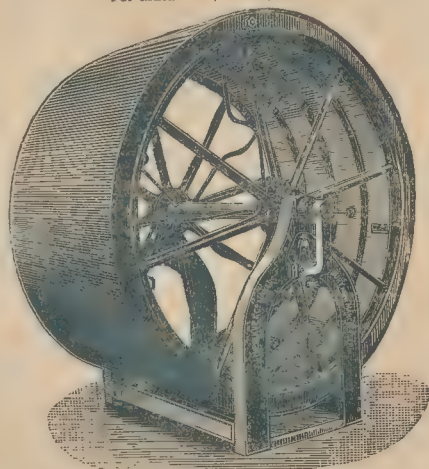
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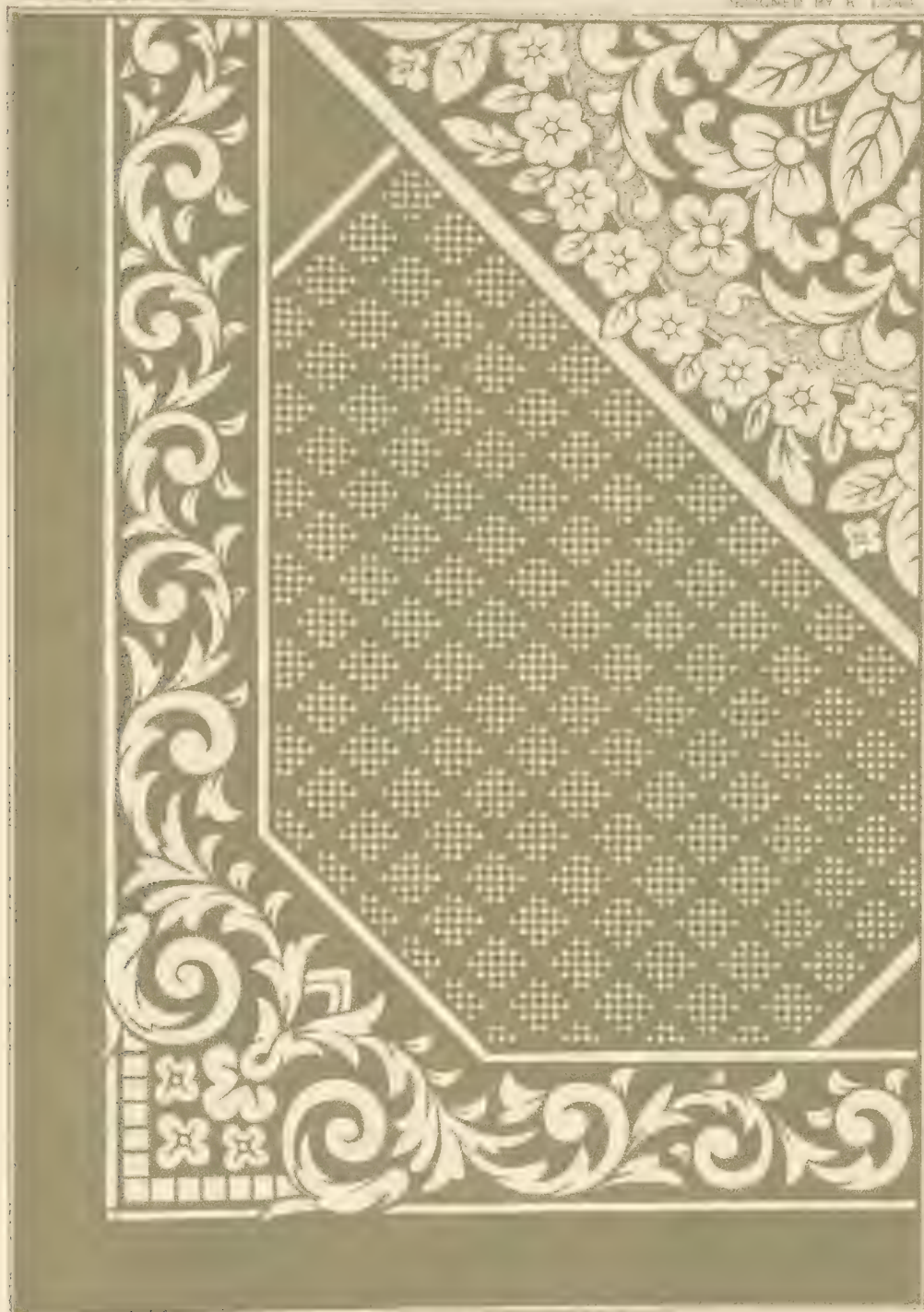
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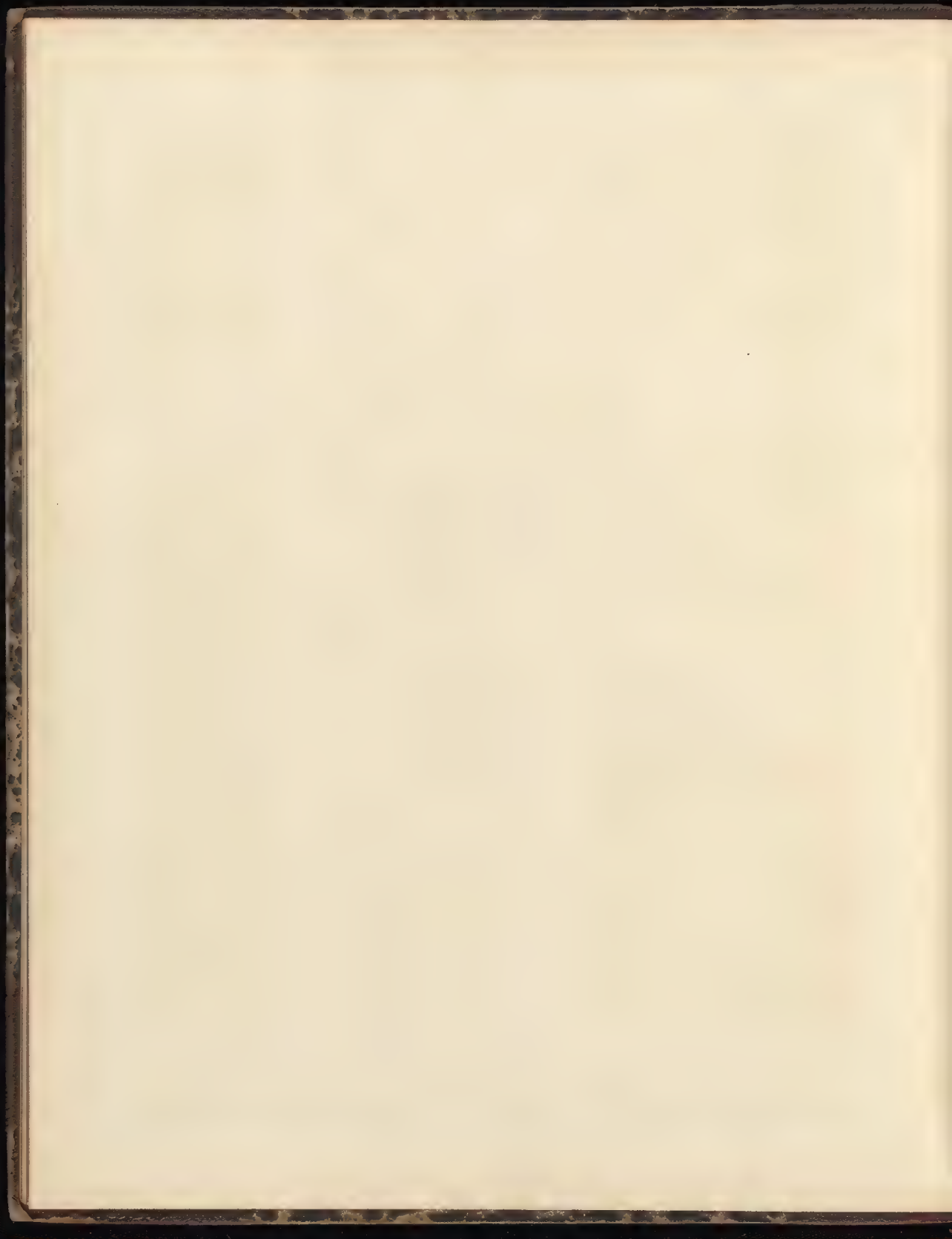
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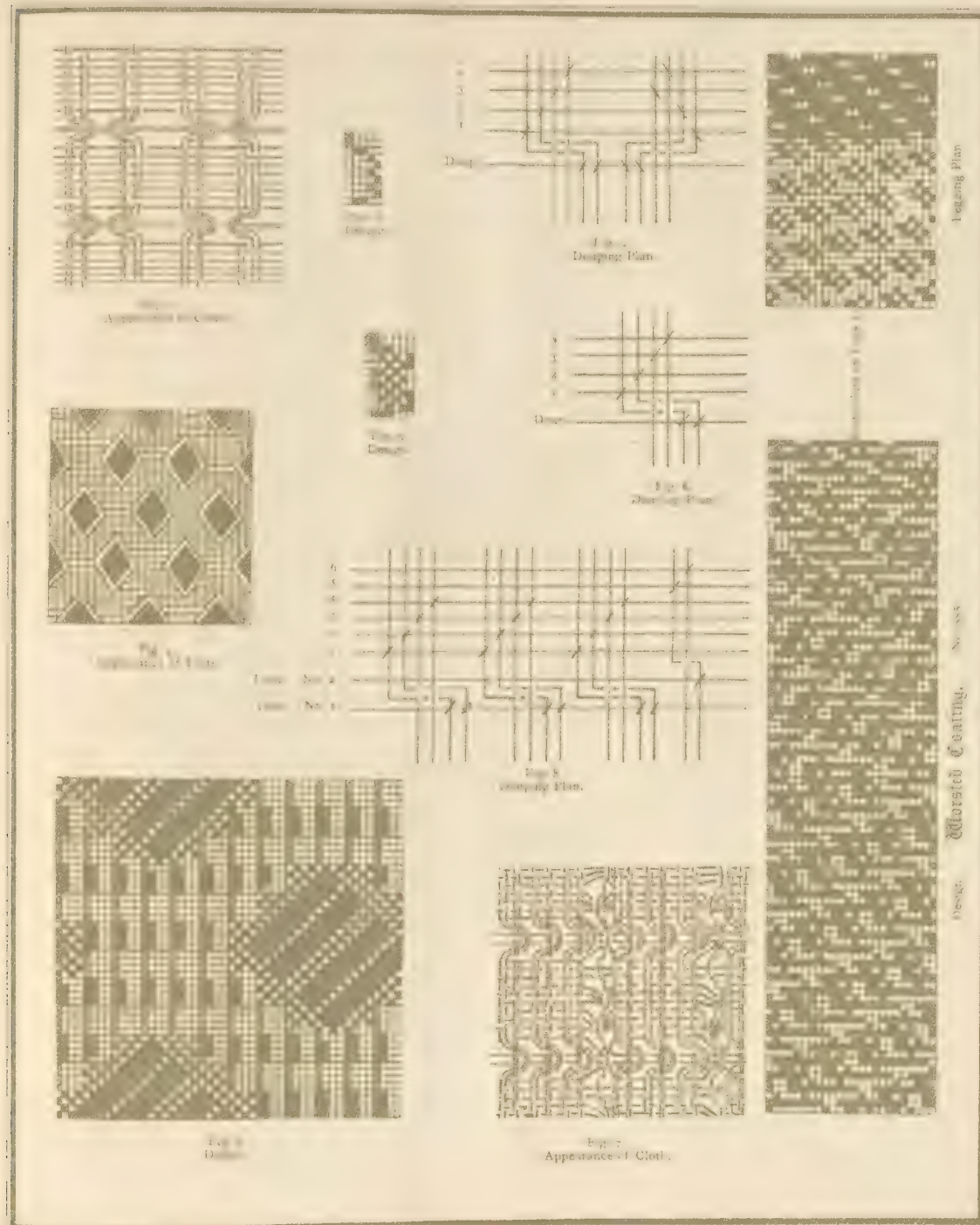
12TH NOVEMBER 1905

DESIGNED BY R. LEWIS



COUNTERPANE.





WEAVING GAUZE CLOTHS.

THE JOURNAL OF FABRICS AND TEXTILE INDUSTRIES.

DESIGNED BY E. LAYTON



BRUSSELS CARPET.

## FASHIONABLE DESIGNS.

## Woollen Trouserings.

No. 552.



Pegging Plan.

Warp:—

- 9 ends Black.  
 3 " Lavender.  
 3 " Blue and White twist.  
 9 " Blue.  
 3 " Lavender.  
 3 " Blue and White twist.  
 9 " Black.  
 3 " Lavender.  
 3 " Red and White twist.  
 9 " Brown.  
 3 " Lavender.  
 3 " Red and White twist.

Weft:—10 skeins woollen.

Warp all 10 skeins.

- 2,176 ends in warp.  
 34 " per inch.  
 32 picks "  
 6 healds.  
 8½ reed, 4 ends in a reed.  
 64 inches wide in the loom.  
 56 " when finished.  
 Soft clean finish.

Weight about 25 ounces.

No. 553.



Pegging Plan.

Warp:—

- 12 ends Brown.  
 3 " Red and White twist.  
 6 " Drab.  
 3 " Red and White twist.  
 12 " Brown.  
 3 " Brown and White twist.  
 6 " White.  
 3 " Brown and White twist.

Weft:—2½ skeins woollen.

Warp all 10 skeins.

- 2,176 ends in warp.  
 34 " per inch.  
 32 picks "  
 6 healds.  
 8½ reed, 4 ends in a reed.  
 64 inches wide in the loom.  
 56 " when finished.  
 Soft clean finish.

Weight about 27 ounces.

## Mantle Cloth.

No. 554.



Draft.



Design.



Pegging Plan.

Warp:—4 ends White.

- 4 " Brown.  
 4 " White.  
 4 " Dark Grey.  
 8 " White.  
 2/10 worsted warp. 4 " Brown.  
 4 " White.  
 15 skeins weft. 4 " Light Grey.  
 4 " White.

1,408 ends in warp; 22 ends per inch; 34 picks per inch;  
 5½ reed, 4 ends in a reed; 64 inches wide in loom; 56 inches  
 wide when finished. Weight about 17 ounces.

## Worsted Suiting.

No. 555.

The Design and Pegging Plan for this cloth are  
 given in our second special plate as they are too large to show  
 on this page.

Warp:—48 ends Black

- 1 end Twist  
 1 " Brown  
 1 " Olive  
 1 " Twist  
 1 " Brown  
 1 " Red

Weft:—72 ends Black.

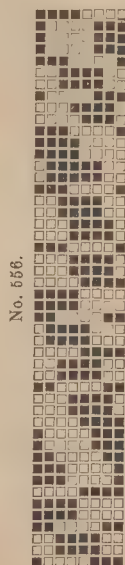
- 1 end Green  
 1 " Black  
 1 " Drab

8 times.

12 times.

6,144 ends in warp; 96 ends per inch; 12's reed, 8 ends in  
 a reed; 68 picks per inch; 64 inches wide in the loom; 56  
 inches wide when finished. 2/30's worsted warp twist, equal to  
 2/60's worsted. 2/30's worsted face weft, 15 skeins woollen  
 back. 2 face picks to 1 back. Weight about 23½ ounces.

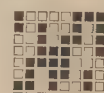
## Wool Suiting.



No. 556.



Design.



Pegging Plan.

Warp:—

- 1 end Grey, 2/18's woollen.  
 1 " Cream, 2/16's "  
 1 " Grey, 2/18's "  
 1 " Cream, 2/16's "  
 1 " Grey, 2/18's "  
 1 " White, 2/14's "

White warp made from 1  
 end of 9's and 1 of 36's  
 twisted together.

Cream warp made from 1  
 end of 2/19's and 1 of 50's  
 twisted together.

2/14's woollen weft all Brown.

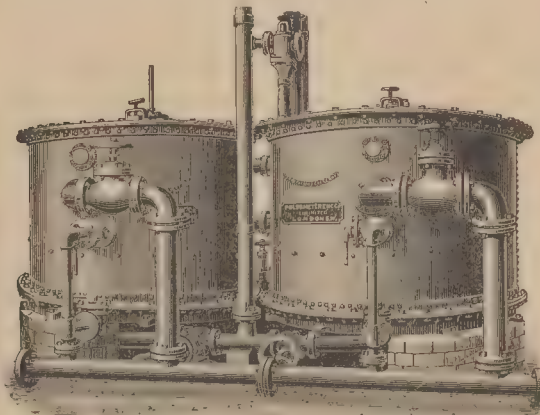
1,550 ends in warp; 25  
 ends per inch; 6½ reed; 4 ends  
 in a reed; 24 picks per inch;  
 62 inches wide in loom; 56  
 inches wide when finished.

Weight 26½ ounces.

## MACHINERY, &c.

### The "Torrent" Filter.

In the majority of industries, the subject of pure water is one of the greatest importance. This is particularly so in the textile trade, which embraces the spinning of fibres, the weaving of all varieties of fabrics, as well as the dyeing and bleaching of the same. Here are four separate industries classed under one heading, each dependent for their success upon a constant and steady supply of pure and soft water, the obtaining of which, in a great number of cases, is a matter of much difficulty. The water at hand may be hard, or muddy, or it may, from various causes, contain certain chemical or other objectionable properties, thus rendering it thoroughly unfit for the purpose for which it is desired to be used. In the first place, impure water produces incrustation in boilers, and wherever this is to be found, there is not only a greatly increased consumption of fuel in heating the water, but also the expense necessarily incurred in scaling, and, at the same time, permanent damage is sustained by the boilers. But there are many other cases which might be cited in which pure water is of the utmost necessity. Take, as an instance, the washing of wool, where, unless accomplished under the best conditions, a permanent injury is done to the fibres, which shows itself when passing through the hands of the dyer, and should the operation of dyeing be undertaken under adverse conditions, what is the result? Imperfect colours, which mean dull, cloudy, or, in other respects, imperfect goods. There are some districts noted for the dyeing of certain materials in particular shades simply because the water at hand is of such a nature as to readily adapt itself for the purpose required. In the bleaching of yarns or fabrics, somewhat similar remarks might be made, as well as in other branches, but we have said sufficient to call to the notice of our readers the fact that, where pure soft water is unattainable, a



resort should be had to some of those appliances which science and a thorough study of the subject have been able to offer as a perfect substitute for that which has been denied either by nature or by adverse circumstances. It is only reasonable to suppose that if pure water can be obtained by filtration for domestic use, it may be just as readily had for manufacturing purposes, and it is, therefore, with pleasure we draw attention to one of the latest successes in filters for attaining this object. We allude to the "Torrent" Filter, made by the Pulsometer Engineering Company, Nine Elms Ironworks, London, S.W. The construction of the "Torrent" Filter may be very readily understood from a short description. The filtering vessel, or body of the filter, is composed of wrought or cast iron, and is sometimes of a cylindrical, and at other times of a square, or tank-like, shape. It contains a layer of charcoal, or other granular material, of a thickness varied according to the kind of water to be filtered; under this is the distributing arrangement, affording passage for the air, supplied by a special apparatus to all parts of the bottom,—lower still the real bottom of the tank. The inlet for the dirty water is above the filtering material, the outlet for the clean water is at the very bottom of the apparatus. An outlet is provided at the upper part of the mechanism for the rapid exit of all the accumulated dirt during the process of cleaning. The filters are usually made close topped, but access is given to all needful parts by man-holes. The working of the filter is simplicity itself. To start it, it is merely needful to open the supply valve and outlet valve; the process of filtration goes on, without diminution of quantity or deterioration of quality, for a number of hours, varying with the character of the water, from five as a minimum to, perhaps, thirty or forty as a maximum. In all ordinary cases, however, the filter should be cleansed every ten hours, and if the owner insists upon this, the material will be kept in a perfect state of efficiency. The cleansing is thus effected:—The ordinary supply and outlet cocks are closed; the inlet pipe for the cleansing water is opened; the outlet pipe for the mud which has to be washed away from above the filtering medium is opened; the cleansing water from below, which need not in most cases be clean water, now rushes up and fills the filter and passes out through the outlet

pipe for the mud; this is the old-fashioned simple reverse current, and very little effect it has in washing away impurities, but the moment that the cock for admission of the high-pressure air is opened, a very different state of things ensues; the whole of the filtering material and contained impurities are seen to boil up, as it were; the most violent agitation takes place, and the particles of dirt are thoroughly loosened by the friction of the air and water, without damage to the grain of the filtering material. Through the mud outlet rushes a stream containing all the matter deposited during the last ten hours, which, dense and opaque at first, becomes gradually clearer as the air and water do their work, until, after the lapse of a few minutes, the effluent has the same tinge as the original sample of water which was to be filtered. The operation is complete—the filtering material settles down into its old position, in less than thirty seconds, so clean that hand washing would not improve it—and all is ready for a fresh start. An installation of these filters for a foreign waterworks, filtering 20,000 gallons of river water per hour, occupied a space in plan of 7 ft. 6 in. by 37 ft. For an ordinary sand filter-bed for this quantity of water, the space occupied would be, if on the same scale as those of the London companies, more than twenty-five times that occupied by the "Torrent" filters. The cost of the "Torrent" Filter varies according to the quantity of water required to be filtered per hour. Thus, for 200 to 300 gallons per hour, the price is £30, whilst that for 2,000 to 4,000 is £150. This firm have also paid particular attention to the softening of water, special apparatus being made by them for this purpose. They are also makers of the "Thames" Filter, and of pumps for almost every possible purpose. These include the Pulsometer Steam Pump, and the Deane Pump for boiler feeding and general purposes. They have also issued a pamphlet, entitled "Pure Water for Manufacturing Purposes, an Economy, not a Luxury." This gives much valuable information in a readable and interesting form, and is well illustrated. Our readers should not fail to have this in their possession, as they would, no doubt, profit by it. This company obtained the only gold medal for filters at the Inventions Exhibition, 1885.

### Appliances for Putting Belts on to Pulleys.

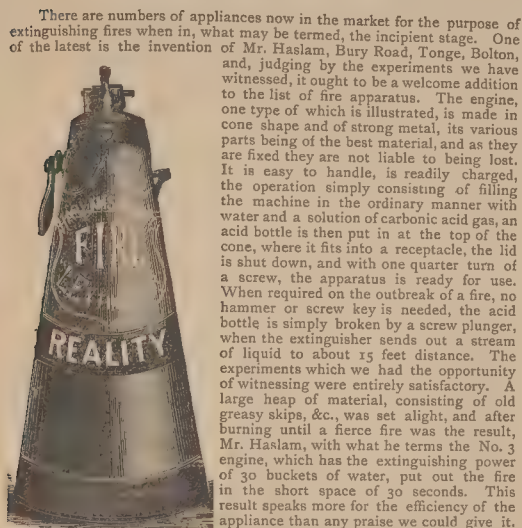
Accidents from carelessness or unforeseen circumstances are continually happening to persons when putting belts on pulleys, and scarcely a week passes without serious cases, often ending fatally, being chronicled in the newspapers. In many casualties the operator is to blame, but in others, the employer is at fault, because he has not provided apparatus that can be thoroughly relied upon to secure the operator from danger. There are many such appliances now being made, and one of the merits of which we cannot speak too highly, has been brought before our notice by Messrs. T. and R. Lees, Engineers of Hollingwood, near Oldham. We have had an opportunity of seeing the apparatus at work, and of examining its mechanism, and we have no hesitation in saying that for simplicity and effectiveness it is highly satisfactory. The appliance consists of a hanger, which is fixed above the shaft at a short distance from the pulley. This hanger, by preference, is forked at the lower end and is astride over the shaft, the part above the centre of the shaft being only just clear of the shaft, so that when the engine begins to race and the shaft begins to vibrate, it cannot jump up and break the pedestal caps or hangers. A tube or long bush is attached to, or formed on, the hanger, through which tube or bush the shaft passes freely.



Appliance for Putting Belts on to Pulleys.

The tube or bush is turned on its outside, and a moveable bush or sleeve is placed upon it. The end of this sleeve, next to the hanger, is formed as a cam, and is pushed against a bowl, revolving on a pivot upon the hanger, by a spring inserted between the other end of the sleeve and a collar upon the end of the tube which is near to the pulley. An inclined lifting arm is formed on, or attached to, the sleeve, and a bracket with a curved lifting plate is bolted to the arm, so that the said plate can just pass over the rim of the pulley, and this can be adjusted to different diameters of pulleys. The lifting plate has a lug or projection formed on it on the side farthest from the pulley. A chain is passed over the sleeve and attached to it, so that, by pulling one end of the chain, the sleeve can be turned round on the tube. The method of using the apparatus is as follows:—The strap to be put upon the pulley is hung over the tube and spring, and its ends are fastened or laced together. The strap, not being in contact with the shaft, does not require to be held, and cannot be lapped round the shaft, and accidents arising from this cause are prevented. The arm of the sleeve hangs down during this operation, the edge of the lifting plate being near to the edge of the pulley rim. When the strap has been pieced, the sleeve is pulled round by the chain, when the inclined arm on the sleeve brings the strap upon the lifting plate, and the latter raises it. As the sleeve is turned further, the cam on its end pushes it towards the pulley, so that the lifting plate passes over the rim of the pulley, and the lug on it pushes the belt upon the pulley. The cam is so formed that it holds the lifting plate over the pulley while passing over the top of the pulley, and releases the sleeve shortly after the plate has passed the top, when the spring moves the sleeve and lifting plate away from the pulley, leaving the strap upon it. Messrs. T. and R. Lees claim the following advantages for the apparatus:—That by its use there is an absence of danger in putting belts on to running pulleys, no ropes or ladders are required, the belts are not injured, great saving in time is effected, and one man can work the apparatus.

### Haslam's Fire Extinguishers.



Haslam's Fire Extinguisher.

There are numbers of appliances now in the market for the purpose of extinguishing fires when in, what may be termed, the incipient stage. One of the latest is the invention of Mr. Haslam, Bury Road, Tonge, Bolton, and, judging by the experiments we have witnessed, it ought to be a welcome addition to the list of fire apparatus. The engine, one type of which is illustrated, is made in cone shape and of strong metal, its various parts being of the best material, and as they are fixed they are not liable to being lost. It is easy to handle, is readily charged, the operation simply consisting of filling the machine in the ordinary manner with water and a solution of carbonic acid gas, an acid bottle is then put in at the top of the cone, where it fits into a receptacle, the lid is shut down, and with one quarter turn of a screw, the apparatus is ready for use. When required on the outbreak of a fire, no hammer or screw key is needed, the acid bottle is simply broken by a screw plunger, when the extinguisher sends out a stream of liquid to about 15 feet distance. The experiments which we had the opportunity of witnessing were entirely satisfactory. A large heap of material, consisting of old greasy skips, &c., was set alight, and after burning until a fierce fire was the result, Mr. Haslam, with what he terms the No. 3 engine, which has the extinguishing power of 30 buckets of water, put out the fire in the short space of 30 seconds. This result speaks more for the efficiency of the appliance than any praise we could give it. In mills of all kinds, and especially in the rooms in which there is always a liability of material catching fire when going through certain operations, apparatus of this class would undoubtedly be a great saving to millowners, in place of the system of having water buckets hanging about, as these have to be constantly looked to, whereas, Mr. Haslam guarantees that, when his apparatus is once charged, the charge will be as efficient in 10 years as it is on the day it was put in. It has been brought before the notice of numerous insurance companies who have, after thorough experiments, advised its use in preference to water buckets. Mr. Haslam will give further particulars on application.

### The Cooper-Newell Humidifier Inlet.

The ventilation of mills and weaving sheds has now become a matter of the utmost importance to cotton spinners and manufacturers, in fact, it suggests itself as an absolute necessity. Machinery has been brought to such a state of perfection that those who have procured the most recent improvements in the construction of cotton machinery are considering that, if any further advantage is to be gained, it must be in the condition of the atmosphere of the rooms in which the process of manufacture is carried on. There is no doubt whatever that, if the climate could always be maintained at one regular temperature, and charged with a sufficient and uniform humidity all the year round, a better quality of material and a considerable increase in the output would be obtained. It is well known that, owing to the frequent change of weather, the spinner and the weaver are caused considerable trouble on account of broken ends. In dry weather, summer or winter, complaints on this head are exceedingly numerous, whilst, in damp or rainy weather, the complaints cease, thus showing that what is necessary in the process of textile manufacture is moisture. Various methods are adopted by the workers to secure this for themselves, but it is admitted that they are very primitive and clumsy methods. The proprietors have also attempted to remedy the grievance, but without success, for, if one point has been gained in any small degree, it has been at the expense of another, and altogether the results, so far, are pronounced by master and servant to be extremely unsatisfactory. Any method having a tendency to send live steam into a room meets with strenuous opposition from the workpeople, and rightly so; such a practice cannot fail to be highly injurious to the health of the people. On the other hand, keen competition forbids the large outlay necessary in order to apply the cumbersome and expensive apparatus by which the grievance is, to a certain extent, mitigated. So that between the two there seems to be a deadlock. The question which presents itself is this:—Taking into consideration the changeable climate of this country, how can air be admitted by simple and efficient means, by which—no matter what the condition of the air may be so affected and conditioned as to enter the room at a given temperature, and containing just sufficient moisture to cause the material to work well and appear better, and that without injury to the occupants of the room? It is also required that the apparatus be simple in construction and easily regulated, so as to meet each varied case, suited to deal with the outside influences, and what is of equal importance, sufficiently low in price to command a ready sale. We, last month, gave our readers a brief description of White's process for applying steam to each individual warp in contradistinction to the usual method of infusing steam into the weaving rooms by means of jets. We have now to place before our readers an invention which, it is claimed by the patentees, dispenses with the necessity of allowing any live steam to escape into the room, not

even so small an amount as is required for the warp only, and further, it is an invention which is not only applicable to weaving sheds, but also to spinning rooms, card rooms, and other portions of the factory. Messrs. Cooper and Newell, of Farnworth, are the patentees of this apparatus and system for heating, cooling, humidifying and ventilating mills and weaving



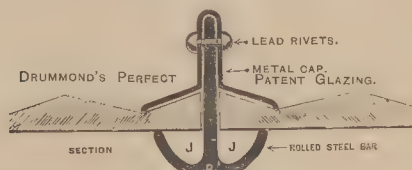
The Cooper-Newell Humidifier-Inlet, shown fixed in a window recess of a card or spinning room.

sheds. As regards card rooms and spinning rooms, the method adopted is to arrange one or more air exhausters or fans of light construction, and of given extracting area and power, in such positions that the vitiated air and dust of the room will be drawn off without perceptible draught, and in equal volume from every part of the room; in conjunction with these exhausters, a number of Cooper and Newell's patent humidifier inlets are placed, care being taken to apply them in accordance with the natural requirements of the room, and with sufficient inlet area to act in unison with the exhausters. The atmospheric air in passing through the humidifier inlets undergoes a similar process to that when it is admitted from the outside on a rainy summer's day. It first enters a warming chamber, and from thence it passes into tubes of a peculiar shape and arrangement, by which means the air is prepared to the proper temperature to receive its equal weight of humidity; it then goes into a humidifying chamber, where it receives the humidity required, which may be very light or very dense, warm or cold, as the case demands. The degree of humidity may at any time be varied, so that there need never be too little, nor too much humidity, either of which would be detrimental to the process of manufacture carried on. The apparatus is fitted with valves and taps, so that the degree of heat and density of the humid air may, at will, be more or less as required. These humidifier inlets being placed at the opposite side of the room to that on which the exhausters are placed, and being always under control, it will be readily understood that, as the exhausters extract the vitiated air from the room, the air admitted by the humidifier inlets must necessarily take its place, thus a constant change of air in the room is going on, and, as the air in its admission is conditioned with humidity, so the entire atmosphere of the room is, by the process, charged with humidity. For weaving sheds, the same apparatus is employed, but applied in a different manner. The facts that sheds are generally very wide, and that there are, during working hours, as many air propellers at work as there are looms (the lathe of the looms continually awaying backwards and forwards) must be taken into consideration, as well as another important fact, viz., that architects always provide a certain amount of space between the edge of the glass and the gutter to allow the condensation which is generated to run into the gutters. Now, if the same method were adopted for weaving sheds as for carding and spinning rooms, the tendency would be that the air exhausters would simply draw or receive their supply of air from these spaces, instead of from the humidifier inlets provided. The consequence of this would be that the incoming air from the roof would hinder satisfactory ventilation, drawing the air downwards instead of upwards. Messrs. Cooper and Newell's method of humidifying the atmosphere of weaving sheds is to arrange a sufficient number of their humidifier inlets along both sides, or both ends of the shed, at suitable distances apart, and connected with the inlet portion of each apparatus a tube runs the length or width of the shed, at the end of each tube is an air propeller driven by power, which, taking the atmospheric air from the outside, forces it forward along the tube, distributing a proper supply to each humidifier, where it is conditioned in the manner described with reference to the application to card and spinning rooms. As soon as the humid air enters the shed, it is propelled forward by means of the lathe of the looms, and, by the same means, the lower atmosphere of the shed is conditioned with humidity; the gutter spaces being better distributed than any other outlet for air could possibly be provide a very natural and efficient outlet for the vitiated air which, by the action of the propeller ventilators, is being constantly lifted upwards. Having described the methods employed, we may now, for the information of those of our readers who understand something of the laws of nature in relation to the tendency of the atmosphere under increased temperature, briefly indicate the arrangements provided in the Cooper and Newell humidifier inlet. First, in the air receiving chamber, which has an inlet for the atmospheric air of 220 square inches, the air after admission passes over the heated surface of a deflecting plate formed by the construction of the hot water chamber within the apparatus; there it is held a sufficient time to allow it to pass through a reduced area—108 square inches, which is provided by a number of tubes arranged to pass the air

through a chamber in which hot water is kept at the required temperature by means of a steam injection in the water, which generates a light vapour. The tubes referred to are so constructed that all the air (and not a portion) which goes through them is made to pass over the inner heated surface, thus being brought to the temperature required; they are also so constructed that the air is allowed to expand in its passage through, and, as the temperature increases, when it arrives at the outlet mouths of the tubes the area is 202 square inches. Having arrived at this point, it should be stated that the space provided for generating the vapour is 86 square inches, which is absorbed by the heated air immediately it meets it at the mouths of the tubes. The air is now a warm humid atmosphere, and, in that condition, it is further allowed to expand to 364 square inches before it enters the room. Thus we have a warm humid air passing in a regular and equal volume through the shed or spinning room, and this, it is affirmed, is what it required in winter time. In summer time, the air which is humidified also requires to be cooled, and, for this purpose, the apparatus is fitted with a revolving spray distributor; this is placed in centre of the 364 square inches, by means of which cold water is broken up by force (not heat) into very minute particles, and distributed throughout the upper portion of the humidifier inlet, thus compelling the air to pass through the cold moisture, which it also absorbs and carries forward. It should be observed that the particles of spray are so exceedingly small that they cannot be perceived except in a good light. As stated above, the apparatus is provided with taps, and may easily be controlled by any person having the most meagre knowledge of what is required. It need scarcely be pointed out that this method of supplying moisture is in keeping with the laws of nature and, therefore, the least likely to be hurtful, at the same time supplying the needs of the spinner and manufacturer.

### Drummond's System of Glazing for Weaving Sheds, Mills, &c.

A system of glazing roofs, &c., of weaving sheds, mills, and other buildings, where a good light is of the utmost importance, was, a short time ago, patented by Mr. Drummond, of the firm of Drummond and Lindsay, Montrose Street, Glasgow, and of Edinburgh, since which time Mr. Drummond has invented a form of corrugated prismatic glass which, in combination with his system of glazing, undoubtedly makes it as efficient for all suitable purposes as any in the market. This mode of glazing, as will be seen from the illustration, is carried out in such a manner that leakage is almost an impossibility if the workmanship be good and the material sound, both of which are guaranteed by Mr. Drummond. The different parts of the mechanism are made to fit accurately, with the satisfactory result of a perfectly water tight joint. Any condensation of moisture on the inside is carried off by the channels J J. One of the leading features of this system is the employment of corrugated prismatic glass, this not having been used for the purpose before being patented by Mr. Drummond. Last month, we



had an opportunity of seeing the actual result of the difference between the corrugated glass and glass ordinarily used for glazing purposes, the light given by the former being considerably brighter and clearer than that by the latter. It is well known that the light given by glass in the form of a prism is superior to that of flat glass, and Mr. Drummond has taken advantage of this fact, and has produced a glazing of a highly satisfactory character. Another great advantage of this corrugated glass for roofing purposes over that ordinarily employed consists in its forming channels along which the water travels, carrying away in its motion, as has been proved by experience, dirt or any refuse that would have a tendency to accumulate on the surface of ordinary glass, so that one great hindrance to a good light is reduced to a minimum. This prismatic glass is equally efficient for the glazing of windows of mills, &c., as the light given is considerably brighter than by the use of the thick ribbed glass usually put in. Mr. Drummond will forward samples and quote prices for glazing large or small surfaces, and will also give estimates for his patented system of glazing, to those interested in the invention.

### Tariff Changes and Customs Regulations.

**RUSSIA.**—Cotton collars surfaced with cellulose, not stitched, but with outward semblance of stitching, to pay duty under section 219, point 1, as linen drapery, not of cambric. Duty 1 rouble, 80 copecks gold, per Russian pound. Half woollen plush, with stamped designs to pay duty under section 202. Duty, 1 rouble, 10 copecks gold, per Russian pound. Cotton tissues cut in designs and embroidered with glass beads, to pay duty under section 222, point 2, as wrought glass beads. Duty, 45 copecks gold, per Russian pound. Articles of exterior feminine attire, of woollen stuffs coated with india-rubber, though without traces of stitching, for which adhesion by gumming is substituted, to pay duty under section 219, point 4. Duty, 2

roubles. 40 copecks gold, per Russian pound. *Note.*—Poud=36 lbs. avoirdupois. Gold rouble=3s. 2d. Russian pound=0.902 lb. avoirdupois.

**SWITZERLAND.**—In category 286, after "webbing for mattresses and bedding articles (warp of dyed cotton and woof of unbleached linen), white webbing for corsets (warp of cotton and woof of linen)" the words "when the weight of the cotton predominates" should be added. Duty, 35 francs per quintal. (If, on the contrary, the linen predominates, these articles are included in category 301. Packing, felt.—Category 311. Duty, 8 francs per quintal. *Note.*—Quintal=220.4 lbs. avoirdupois. Kilogramme=2.204 lbs. avoirdupois. Franc=9.45d.

**SPAIN.**—Tissues of cotton dyed, having in warp and woof groups of four threads crossed in the form of a design, leaving between them space equivalent to those occupied by the said groups.—Category 106. Duty, 2 pesetas, 40 cents. per kilogram. Tissues of cotton, composed of two series of threads, which, being crossed, form the net characteristic of tulle.—Category 111. Duty, 4 pesetas 18 cents. per kilogram. The same, with machine-worked chain stitch embroidery.—Same category. Duty, an addition of 30 per cent to the above duty. Silk lace.—Category 157. Duty, 20 pesetas 40 cents. per kilogram. Cases or boxes of cardboard lined with paper, containing an embroidery loom of common wood, a small quantity of woollen yarn, cotton yarn, and silk floss, two patterns of tapestry and embroidery, and two cases with glass beads.—Category 290. Duty, 1 peseta 30 cents. per kilogram. *Note.*—Quintal=220.4 lbs. avoirdupois. Peseta=9.45d.

**UNITED STATES.**—Flax which has been imperfectly "scutched" and hackled by means of the Cardon machine, the tow being but partially removed, is held to be dutiable at the rate of 20 dollars per ton, under the provision in Schedule J (T. I., 328) for "flax, not hackled or dressed." Rugs, which are manufactured from Tournay velvet carpeting, are held to be dutiable at the rate of 45 cents per square yard and 30 per cent. *ad valorem*, under the provision in Schedule K. (T. I. 370) for "Tournay velvet carpets, and the further provision in said Schedule (T. I., 378), which prescribes that rugs shall be subjected to the rate of duty imposed on carpets or carpeting of like character or description. Certain so-called worsted cloths, commercially known as "cheviots" which, upon examination, were found to be composed wholly of wool, are held to be dutiable at rates according to value per pound, as prescribed by Schedule K. (T. I., 362), for "woollen cloths and all manufactures of wool of every description, made wholly or in part of wool." Certain cotton fabrics which have undergone a process of "scouring," consisting of washing in cold or hot water or boiling with alkaline lyes or soaps, to remove the resinous, greasy, and other impurities of the fabrics, and is the initial process of bleaching the fabrics, are held to be not liable to the duty imposed on bleached cottons, inasmuch as such scouring does not remove the fabrics from the condition of unbleached cotton cloth. Pieces of wool cloth measuring over one yard in length, and having a substantial and merchantable value, are not exempt from duty as samples. Certain so-called "wool blanketing" composed in part of wool, and intended for manufacture into card-cloth, which does not assimilate to flannels and blankets (T. I., 363), and is not used for the same purpose as are "endless belts or felts" (T. I., 379), is dutiable as a manufacture in part of wool, under T. I., 362. So-called "wool-back" worsted coatings, composed of wool and worsted are dutiable, under T. I., 362, for manufactures composed in part of wool.

**PARAGUAY.**—The following are a few of the regulations which govern imports and exports:—All merchandise of foreign origin pays an import duty of 25 per cent *ad valorem*, except (as far as our readers are concerned) made-up clothing, 40 per cent, all silk goods, 30 per cent, all articles trimmed with gold or silver, 10 per cent, and leather per piece, 50 cents, machinery is admitted free of duty.—*Board of Trade Journal.*

### Natural Wool Carpets.

The application of natural or undyed wool for clothing fabrics has, for a considerable time, occupied much attention and, following upon this, manufacturers have been giving their consideration to the subject in order to utilize natural wool for all available purposes. The result has been that many varieties of goods have been made from undyed wools, which had previously been rendered attractive by the various dyes employed in their manufacture. The latest step in this direction has been taken by an enterprising manufacturer who has been granted a patent for the application of natural wools to a purpose which, probably, few would have thought of, viz.:—The manufacture of Brussels, Wilton, and other carpets. Hitherto these carpets and rugs have been woven from dyed worsteds or from worsteds spun from dyed wools, but some of the colours used in the same do not in all cases permanently retain their shade, and certain colouring matters are by some makers produced by aniline and other dyes. But, according to this invention, instead of using dyed worsted or worsted spun from dyed wools, undyed worsteds are employed, that is to say, worsteds spun from wools retaining their natural colours, such as fawn, brown, black, and others. These are selected and blended to produce patterns and designs in the ordinary loom, the various natural coloured worsteds in the frames being arranged precisely the same as with dyed worsteds, and having the usual pitch or count of the cloth in the reed, and the usual number of wires or stitches to the inch, in the process of weaving. One or more natural coloured wools will be used in a single worsted as may be required, according to the effect to be produced. Messrs. Brinton and Co., Limited, Kidderminster, and Mr. John Henry Pearse, a director of the Company, are the patentees.

### Fashionable Fabrics.

Our printed calico industry, says *Kuhlow's Journal*, is preparing very pretty novelties for next summer, some of which will differ entirely from the designs known; for instance, one idea is to print on multicoloured grounds, and if we may judge from those we have seen at present, the idea will prove a successful one. Printed goods will, by no means, be confined to cotton textures, though the same will naturally play the greatest roll. We have seen printed Crêpes de Chine, Poulard, and Surah fabrics, of which the Crêpes de Chine seem destined to give many useful hints. Before we enter into details on the qualities and designs for the same, we will just refer to the general character of the latest prints. The flower patterns are never likely to disappear in consequence of the richness of the colours which they bring, but we may count, next season, on a variety of Arabesque, fruit, and other ornamental figures. It has not been forgotten to suit the taste of the hour, and to this end we have imitations of the designs of silk laces, both in stripes and border form; there are also true copies of some of the best designs of the now modern gilt embroidery. Among the stripes, there are many that cannot lay claim to novelty, such as intermixtures of small figures, interrogation marks, crescents, &c.; these, however, will continue to answer their purpose for the cheaper trade. The printing on coloured grounds, above mentioned, refers only to cotton goods; the Chinese crapes, foulards, &c., have in their fine tissues already sufficient foundation. As multicoloured grounds, we have seen mild rayé stripes, and moiré foundations. It is particularly essential in printed goods that the colours should be well blended. The fashionable green, which will again be worn next spring, is to be already seen in about sixteen shades, from the lightest May green to the darkest marsh and myrtle green. Plants, grasses, and ferns, are imitated to perfection. After green, the terra tones are the most predominant; in red, the leading shades are blue, coral, copper, and coral, which are mixed with apricot blossom, bronze, and coffee brown. The metallic gilt hues, verdigris, and rust tints, are seen either alone, or mixed with other colours. Of the blendings named here, mixtures have been produced with most pleasing results, wherever they have been shown in the above described manner. Another contemporary says:—The materials that will be most used during the approaching season, are, first of all, velvet, handsome Lyons velvet, either plain or fancy. In the way of silk, the prevailing style will be the new manufacture called granite, which is self-coloured, but woven with a small pattern, something like what used to be called armure, also moiré, striped pekin, and satin; and those splendid rich silks called matisse, woven and brocaded with patterns and soft shades, resembling the tints of Indian cashmires. This and the granite are the newest things. They are also making in silk, as well as in woollens, what they call peutes, for costumes, that is to say, the materials are double width, and have deep borders woven in of different shades, with patterns of feathers, palms, flowers, &c. There are also narrow borders to match for trimming the bodices, &c.

### Fixation of Alumina and Oxide of Iron.

The padded goods, or those with mordants printed upon them, are dried by hot air, or by passing them over steam heated cylinders, then pieces are submitted to some treatment designed to decompose the compound of the metal, so that the oxide of alumina or iron may be fixed in a suitable state for the absorption of colouring matter. Formerly, it was the custom to suspend the pieces in large chambers with cloth partitions, where they often remained for more than a week. Left thus to themselves in the air, the salts of alumina and iron were slowly decomposed, the action commencing as soon as they were printed. The time of ageing varied according to the amount of moisture in the air. The acetic or pyroligneous acid separates itself slowly from the oxide and evaporates, leaving the oxide on the fibre in a nearly insoluble state. Thus, atmospheric variations could do great injury. It often happened that a portion of a piece was finished, while the decomposition of the remainder was incomplete. As the outside appeared to be finished, the goods were often spoiled by stopping the ageing too soon. Some manufacturers noticed that the ageing took place more rapidly in wet weather, and did their ageing above running water, so that the air might be perfectly saturated with moisture; but this was not sufficient. John Thom, in 1849, was the first to invent an apparatus for moistening the pieces and ageing them afterwards in a warm chamber filled with steam. In 1856, Walter Crum, the great manufacturer of Glasgow, devised and built in his works an apparatus which renders great service and meets all the requirements. It consists of a room well isolated from atmospheric changes, best in the centre of a building, and without contact with the exterior walls. In the interior are two rows of hot cylinders at the top and bottom; jets of free steam are also admitted, which keep the temperature at about 100°, and saturate the air with moisture. The saturation is carefully regulated by means of a wet and dry bulb hygrometer. When the air is thus charged with moisture, the pieces which enter very dry rapidly lose the hard touch which they have at the beginning, and become supple, indicating an absorption of moisture; they are then in good condition for the decomposition of the mordant used. In Crum's continuous ager, the goods enter at the top of the chamber and pass up

and down over rolls heated by steam, and come out in one piece. The speed is regulated so that the pieces remain about twenty minutes in the apparatus. During this time, acetic acid is freely disengaged and escapes by a chimney in the top, and is led into a double flue to prevent condensation. When the pieces come out, the mordant is not yet fixed; but, if the action is once begun, it will go on by itself until it is finished. The moisture is necessary for the chemical action. The goods must not be piled up too solid, but they should be made into bundles and left standing for from twenty-four to forty-eight hours until the action is finished; if they are hung up, they become too dry, and if they are in rolls, they lack air. The oxidation of the iron has a strong tendency to weaken the fabric; different salts have been added to the pyrolignite which furnish oxygen as required, such as nitrate and chlorate of potash, or the oxidation is made slower and regulated with sal ammoniac. The iron mordants are not only decomposed by the operation, but the iron, in contact with oxygen, passes from the lower to the higher state of oxidation which is necessary for alizarine dyeing. Some manufacturers hasten the complete transformation of the iron mordant by passing the pieces several times through the apparatus. This apparatus is known as an ageing machine.—*Bourcard*.

### Methods for wool dyeing.

**YELLOW.**—This colour can be produced in different ways. According to the old methods, yellows were dyed with quercitron, flavine, &c. All these colours stand fulling; as far as the action of light is concerned, they are much inferior in fastness to the artificial colours, such as tartrazine, chrysamine, and alizarine yellow. Tartrazine, dyed with sulphate of soda and sulphuric acid, gives a fine bright yellow, good for fulling; the same is true of chrysamine, which can be dyed without mordanting, with the simple addition of common salt. If this colour be well fixed on wool fibre, it is not destroyed by the light, even after an exposure of many months. Alizarine yellow, known under different names, galloflavine, &c., unites the desirable properties of resistance to light and fulling, but the yellow shade is not as bright as that of chrysamine.

**RED.**—Reds used to be dyed with cochineal, madder, &c., but, to-day, the azo reds and alizarine are preferred. The fastness of azo colours to fulling is not remarkable, the colour only resists to a certain point, that is to say, it begins to bleed when the fulling is too strong, and, therefore, it is not well to use these colours with whites. To resist light, certain ponceaus are gaining upon cochineal. For pinks, rhodamine best stands fulling, even in light shades. Rhodamine is, without question, superior to all the other colours, such as rose bengal, erythrosine, &c. The methods of applying azo colours and alizarine are so well known that we pass them by.

**GREEN.**—A green, fast to fulling, can be obtained by boiling with chromic and sulphuric acids, and dyeing with logwood, Lima wood, and a little indigo carmine, or it can be blueed with vat indigo, or even with alizarine colours, which, on account of their resistance to light, should have the preference. A green, topped in vat indigo, and exposed to sunlight, will change in a few days, while goods dyed with ceruleine do not alter.

**BLUE AND VIOLET.**—Blues and violets are obtained in various ways. If light blues or violets are wanted, they must be dyed with alkali blue and methyl violet, there are no substitutes for these colours; if dyed with care, they give excellent results. There is a new violet, fast to light and soap, called rosoline, which will be useful and will be easily introduced. Alkali blues are applied in the well known way. If a blue, which is not fast to light, will answer, Victoria blue can be used with a single bath. Dark blues and violets can be obtained better, with the vat, with alizarine, and for cheap blues, with logwood. Dyed with chromic acid, sulphuric acid or alum, oxalic acid, tartar, &c., these colours resist fulling. For a blue, on washed wool, for 100 lbs., boil one and one-fourth hour with:—Alum, 10 lbs.; tartar, 2 lbs.; oxalic acid, 2 lbs.; tin salts, 1 lb. Dye the following day with the necessary quantity of logwood, and sadden with blue vitriol. This blue stands fulling, and the receipt is a good one.

**BLACK.**—The wool can be chromed, or dyed in a single bath. According to my own experiments, I prefer the latter way on account of its simplicity and the better resistance of the colour to light. Although chrome black is soft and open, with the necessary precautions as good results can be obtained in a single bath, and it can be used on consecutive portions of wool. I recommend the following receipt:—For 100 pounds of wool use 12 pounds of logwood extract, 3 pounds of sumach extract, and 5 pounds of red wood; or for a deep black 2 to 3 pounds of lima wood extract. Enter the wool, boil one and a half hour, sadden, little by little, with 8 pounds of copperas, boil fifteen minutes, and add one half pound of soda. Blacks coloured upon a heavy vat or alizarine blue ground are seldom asked for on account of the expense. For the dyeing operations, use the Obermaier apparatus, or a double boiler. Free steam must not be used on uncarded wool; indirect heating is the best for dyeing such wool, but too much time is necessary. If it be absolutely necessary to work with free steam, use a coil, with the openings turned toward the kettle, place it at the bottom, and put over it a perforated plate. Good results can be obtained in this way.—*Jour. de Teinture*.



## PATENTS.

### Applications for Letters Patent.

Applying hydraulic power, by which means are provided for economising and generating such power. R. Middleton, Leeds.	3rd Oct. 14,200
Automatically stopping a loom. J. W. and B. H. M. Worswick, Padiham.	6th Oct. 14,370
Automatically producing striped or checkered fabric on the French circular loom. E. C. Frenzel, London.	9th Oct. 14,534
Automatically reversing burl-dyeing, &c., machines. R. Middleton, Leeds.	15th Oct. 14,779
Applying colours to printing rolls. J. V. Hulme, London.	25th Oct. 15,397
Brake for tin rollers of self-acting mules. S. Shaw, Manchester.	28th Sep. 13,949
Birling or tying fringes. J. M. Collins, Bridgeton.	8th Oct. 14,413
Batching flax, jute, tow, &c. J. Morrison, Glasgow.	9th Oct. 14,469
Belts, bands, or straps. T. Hill, Queensferry.	25th Oct. 15,354
Coverings for cotton bales. O. Imray, London.	28th Sep. 13,979
Cleansing wool and other textile products. G. and A. Burnell, London.	29th Sep. 14,039
Cleansing wool, &c. I. Singer, London.	1st Oct. 14,101
Certain carding engines in which revolving flats are employed. T. S. Whitworth, Manchester.	2nd Oct. 14,147
Covering and preventing radiation from boilers, &c. J. Grange, Bradford.	2nd Oct. 14,157
Cleaning yarn, &c. H. F. West, London.	3rd Oct. 14,243
Cleaning wool, &c. J. Singer and M. W. Judell, London.	3rd Oct. 14,247
Cutting and selvaging double width cloth in looms. G. Huck, Burnley.	4th Oct. 14,254
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Combs and carriages in twist lace machines. G. Mason, London.	10th Oct. 14,566
Curtains (fire-proof) for theatres, &c. J. Tollerton, London.	12th Oct. 14,681
Cylindrical tapered, &c., tubes. W. Pilkington, C. T. Bishop, and A. Brownwood, London.	15th Oct. 14,799
Carotting wool on sheep and lamb skins, &c. P. Puech, London.	15th Oct. 14,809
Consuming smoke. E. D. Tovee, London.	17th Oct. 14,939
Cutting, raising, or dividing, woven, knitted, or other piled or looped fabrics. G. H. Nussey and W. B. Leachman, London.	23rd Oct. 15,230
Cut-pile fabrics and apparatus. G. A. J. Schott, Bradford.	24th Oct. 15,285
Dyeing vegetable fibres in sliver, yarn, &c. W. E. Heys, Manchester.	29th Sep. 13,999
Dyeing, bleaching, &c., yarn, in cops or bobbins. S. Mason, junr., and W. T. Whitehead, London.	29th Sep. 14,019
Driving bands for spindles. S. Rowbottom, Manchester.	2nd Oct. 14,141
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Dyeing animal and vegetable fibrous material. J. and R. Rhodes, London.	5th Oct. 14,346
Drying, cleaning, and bleaching fibrous material, &c. W. H. Preston and A. Torpey, Liverpool.	6th Oct. 14,360
Drawing back the gear and levelling the shafts of looms. T. Kershaw and Messrs. Pearson and Spurr, London.	6th Oct. 14,362
Drying, cleaning, and bleaching, wool, cotton, &c. A. Torpey, Liverpool.	11th Oct. 14,617
Dobbies for operating healds of looms. A. Sowden, Halifax.	16th Oct. 14,835
Drying wool "tops," &c. F. Rhodes, Huddersfield.	18th Oct. 15,000
Damping and conditioning machines for bleaching, calendaring, &c. J. Dwyer, Manchester.	19th Oct. 15,019
Disazo dye-stuffs. J. Y. Johnson, London.	23rd Oct. 15,258
Embossing and cutting to designs or cutting separately—leather, cloth, paper, &c. W. Ross and J. Bilby, London.	4th Oct. 14,289
Forming and fixing the back of lined fabrics. F. Dehaetre, London.	3rd Oct. 14,232
Fastenings of driving bands or belts. C. H. Watson and W. Holden, London.	13th Oct. 14,773
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Feeding carding engines. T. H. Ackroyd, A. Broadley, and S. Raistrick, Bradford.	20th Oct. 15,080
Gig-mills. C. Wood, Manchester.	5th Oct. 14,303
Grinding flats of carding engines. J. Edge, Liverpool.	10th Oct. 14,556
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Heating feed water for steam boilers, and effecting deposit of impurities therefrom. C. J. Galloway and J. H. Beckwith, London.	16th Oct. 14,880
"Hand-cards" for combing the carding cylinders of carding machines. A. Haley, Bristol.	25th Oct. 15,349
Imitation sealskins, fur, velvet, chinchilla, &c. H. Lister, Huddersfield.	13th Oct. 14,708
Looms. B. C. Sykes and G. Blamires, Halifax.	2nd Oct. 14,139
Looms for sailcloth, &c. J. S. Smith, Manchester.	6th Oct. 14,376
Lace net. J. Taylor, Nottingham.	10th Oct. 14,554
Loom dobbies. W. Walton, Bradford.	13th Oct. 14,735
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Leather link driving belts. J. Fenton, Glasgow.	23rd Oct. 15,218
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Measuring machine. B. R. Bond, London.	16th Oct. 14,868
Mountings of skewers of loom shuttles. A. Sowden, Halifax.	18th Oct. 14,960
Ornamental fabrics for covers, curtains, &c. C. K. Mills, London.	28th Sep. 13,995
Process and apparatus for treatment of textile plants. L. De Kien, London.	1st Oct. 14,100
Pickers for looms. J. Greenwood, Manchester.	6th Oct. 14,369
Plush or cut pile fabrics. J. Lewisohn, London.	9th Oct. 14,514
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Pleating fabrics. F. Melvanna, London.	13th Oct. 14,712
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Printing textile fabrics. S. Knowles, Manchester.	24th Oct. 15,283
Piano jacquard card-cutting machines. A. R. Sadler, J. R. Beard, and J. Godwin, London.	25th Oct. 15,357
Raising and beating silk and cotton plushes, velvets, and seal cloths. T. Chadwick, Manchester.	16th Oct. 14,840
Ring spinning and doubling. G. Balfe, Manchester.	23rd Oct. 15,214
Step and bolster bearings for spindles of spinning and doubling machines. S. Tweedale, Halifax.	29th Sep. 14,001
Steam boilers. T. Wingate and L. Burnet, Glasgow.	29th Sep. 14,002
Split or salvage motions of looms. J. Hunt and H. Heap, Halifax.	1st Oct. 14,071
Spooling machines. J. Halliwell, Manchester.	2nd Oct. 14,125
Securing card fillets or clothing to cylinders, &c. G. H. Schofield, Manchester.	3rd Oct. 14,205
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Spindles for spinning and doubling. F. King, London.	4th Oct. 14,272
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Smoothing or finishing textile threads. E. P. Klug, London.	12th Oct. 14,705
Screw presses for bundling cotton, &c. S. Coupland, London.	13th Oct. 14,713
Spinning and doubling. J. Seed, Preston.	17th Oct. 14,916
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Spinning. S. Hallam and E. Tilston, Manchester.	19th Oct. 15,018
Shearing wool or hair. F. Ross, Liverpool.	25th Oct. 15,358
Table covers. J. Inglis, Bolton.	28th Sep. 13,953
Taking-off motion for looms. A. G. Fox and J. E. Ashton, Manchester.	18th Oct. 15,010
Treating wool, cloth, yarn, &c. F. Moore, London.	20th Oct. 15,103
Twisting or winding yarns, &c. W. P. Thompson, Liverpool.	22nd Oct. 15,166
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Union yarn and apparatus therefor. W. C. Whitehead and J. Maddocks, London.	12th Oct. 14,700
Under clearer springs of machinery used in the manufacture of textiles. C. H. Pugh, London.	17th Oct. 14,930
Waterproof fabrics. D. Nicoll, London.	28th Sep. 13,971
Weaving Smyrna or tufted carpets. J. C. Mewburn, London.	28th Sep. 13,973
Washing or cleansing oily engine waste, &c., and apparatus therefor. J. H. Williams and M. W. Hydes, Liverpool.	28th Sep. 13,993
Wire mails or needles for jacquard harness and healds. J. Stoddart, London.	2nd Oct. 14,154
Wet-bobbin. A. Smith, London.	9th Oct. 14,487
Wood-wool—apparatus therefor. S. and T. Cooper, Manchester.	16th Oct. 14,834
Weaving loom for domestic purposes. G. K. Gordon, London.	17th Oct. 14,942

### Patents Sealed.

6,213	8,947	10,625	11,017	11,614	11,902	12,561	12,854
12,916	12,947	13,086	13,272	13,633	14,644	2,070	3,421
5,605	5,907	8,714	10,788	12,667	12,948	13,337	13,358
13,400	13,762	13,980	14,678	16,484	5,072	9,619	12,179
12,621	13,435	13,473	13,588	13,686	13,687	13,690	14,005
5,592	8,663	8,828	9,768	9,846	9,909	7,223	11,338
12,010	13,786	13,799	13,849	13,871	13,905	13,989	14,066
14,178	14,240	1,814	2,053	4,861	5,226	7,417	9,729

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## Notices.

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## A New Method of Manufacturing Carpets of the Turkish or Indian Style.

The making of Turkish and Indian carpets has for long been a speciality in Eastern countries, but, recently, a patent has been taken out in this country for a new method of making them. In carrying out the manufacture, a plain web is made of any suitable fibre, and of a convenient thickness and closeness of texture, but, by preference, it is of a shrinkable material, of a known rate of shrinkability. This web may be left the natural colour of the yarn, if desired, but it will give more finish to the carpet if it be dyed some colour harmonizing with the tints of the tufting wool, so that it may not assert itself too much in the completed goods. It may, also, be made the full width of the intended carpet, or in narrow strips to be joined together by sewing or other means, before, or after, being embroidered in the manner hereinafter described:—The rate of shrinkage of the material must be borne in mind, and, if the finished carpet is intended to have eight tufts to the lineal inch, then the web must, presuming a shrinkage of 25 per cent., have only six tufts to the inch; the carpet will also have to be made one-third longer and wider than it is intended to be when finished. This shrinking process is by no means to be considered compulsory. It may be carried out where desired, but, in most cases, it will be found practically superfluous. The web, when ready, is rolled upon a beam which takes the place of the usual warp beam, and is placed in an embroidery loom. The free end of the web is then unwound, carried over a small roller, through a feed motion, to an embroidery bar. It is then folded back, carried under draw-off rollers, and passes off again over a large roller. In thus arranging the web, great care is taken that it is kept as straight as possible, so that it may be fed through the machine in a flat and regular manner, and not tend to run in from either side, or to buckle up in its course. The embroidery bar crosses the loom from side to side; and, in cross section, is a wedge, or triangle, or a cone, or any figure, providing it has a ridge over which the web may be folded. This ridge is not a sharp edge, however, but is cut down until a plane is formed the whole length of the bar, and about an eighth of an inch wide, upon which the weft thread which is being operated upon may lie. This plane may be slightly

grooved out for the better accommodation of the wefts of the weft thread, and may be provided with cross niches at suitable intervals to allow the easier passage of the needles. The embroidery bar is furnished with vertical slits at intervals, on its front and back faces, if triangular or conical in section, or in any convenient place if of any other figure, and through these slits work, at regular intervals, small steel points attached to endless chains or bands and operated by suitable wheels, bars, or rollers, at the top and bottom, the top one being within the body of the bar. By the action of the loom, all the points in one horizontal line are simultaneously inserted under one and the same line of weft thread, and, so raise it evenly to the ridge or top of the bar. The top of the bar, however, being solid, the points are automatically withdrawn before reaching so far, and, crossing to the back face, are again thrust into the carpet and aid its onward progress to the draw-off rollers. In lieu of the above, the ordinary sewing machine feed motion may be applied. The tufting yarn is partly dyed, or drum printed. Presuming that each pattern stitch takes  $2\frac{1}{2}$  inches of tufting yarn, and that the first line of the pattern vertically taken reads as follows:—4 stitches red; 3, green; 2, yellow; 1, black, &c., then the yarn is dyed or printed accordingly, 10 inches red; 7  $\frac{1}{2}$  inches green; 5 inches yellow; 2  $\frac{1}{2}$  inches black, and so on; and, if the repeat of the pattern, read horizontally, occurs at, say, 9 inches or the 72nd thread, the yarn is warped 1st and 72nd—2nd and 73rd, and so on, and it is wound upon a beam which takes the place of the pile beam in an ordinary velvet loom. The embroidering needles are of the usual point-eyed or sewing machine type, and are fixed in a bar by binding screws or other means. The bar extends the whole width of the loom, or of the piece of web in work, and the needles may be one-eighth of an inch, or one-sixth, or any other suitable interval apart. A simple backward and forward motion is given to the needle bar by cam, or pitman, or other means, from one or both sides of the loom. On the needle bar is arranged a series of spring or lever "take ups," or a single one operating all the threads may be employed, the object being to pull the yarn tight when the needle is withdrawn from the cloth; and, behind this series of, or single, "take ups," or in any other suitable part, is fixed a series of "tensions," or a single tension, extending the whole width of the loom, by which the tightness of the yarn can be regulated at will. Facing the needles, and in close contact with the web, which it presses against the embroidery bar and holds in its place, is a "presser bar," furnished with a series of small hooks or indentations, one for each needle. To this bar is given a circular, or an up and down eccentric motion, the purpose of which is to catch the tufting thread as soon as the needle is withdrawn from the web, and to carry it downwards, so that the thread shall be kept clear of the needle point at the moment when the next stitch is being commenced, and then release it so that the needle may draw it tight. Behind the embroidery bar is a series of small rods, point upwards, one for each needle, and these points, by suitable motion, are made to enter the loop formed by the yarn at the moment of the needle's retrocession, just as the shuttle of a sewing machine enters the loop in the cotton at the corresponding period of the stroke, and to hold the yarn at the proper length to form the future tuft while the needles are withdrawn. The lower part of these rods changes to knife edges to cut the loops as they are forced down upon them by the clearer bar next described. Behind these points is a clearer bar which, at the proper moment, that is, just as the steel points above referred to move the web forward one stitch, strikes the loops already formed and held upon the rods mentioned, and so tightens them, forces them downwards towards the cutting knives, and clears the way for the next stitch. The web being in its place, the pile yarn is brought down and each thread threaded through, first the tension, then an eye near the foot of the "take up," then through the take up, back again to an eye near the needle shank, and then through the eye of the needle itself, and knotted at the end. The tension is then regulated so that it shall be the same as it was when the yarn was printed, and the loom is ready to start. When power is applied, the needles insert the tufting wool under a line of the weft, and retire, the loops being caught on the rods referred to. The presser bar catches the tufting wool in its hooks and pulls it aside, the steel points of the feed motion advance the web the distance of one stitch, and the clearer bar forces the loops already formed down upon their respective rods. Then the whole series of motions is repeated until the carpet is finished, when all the tufting threads are cut, and the ends knotted as at first. The needles are then thrown out of action, the web moved forward 6 inches or so, and the embroidery re-commenced. When the first carpet is quite below the draw off rollers, it may be cut off, the warp ends tied or secured, the carpet wetted or steamed to shrink it according to the plan mentioned, and stretched to dry upon a frame in the usual way, so that it may not shrink more than is intended, nor dry out of the square. By these simple means, the inventor claims to be able to make a carpet fully equal to the costly productions of Turkey or India at a fraction of the cost, and, by the peculiar stitch obtainable by means of the folded cloth, which has not hitherto been used in carpet manufacture, to have found a method of securely, easily, and rapidly, binding in the tufts, so that they shall not pull out by any ordinary wear and tear to which the carpet is likely to be subjected. He also claims the method of inserting the tufts directly into a previously woven material, by the aid of a modification of the sewing machine, and without the use of cotton, thread, or similar means of fastening the same, as well as the method of further tightening the binding in of the tufts by the shrinking process described.

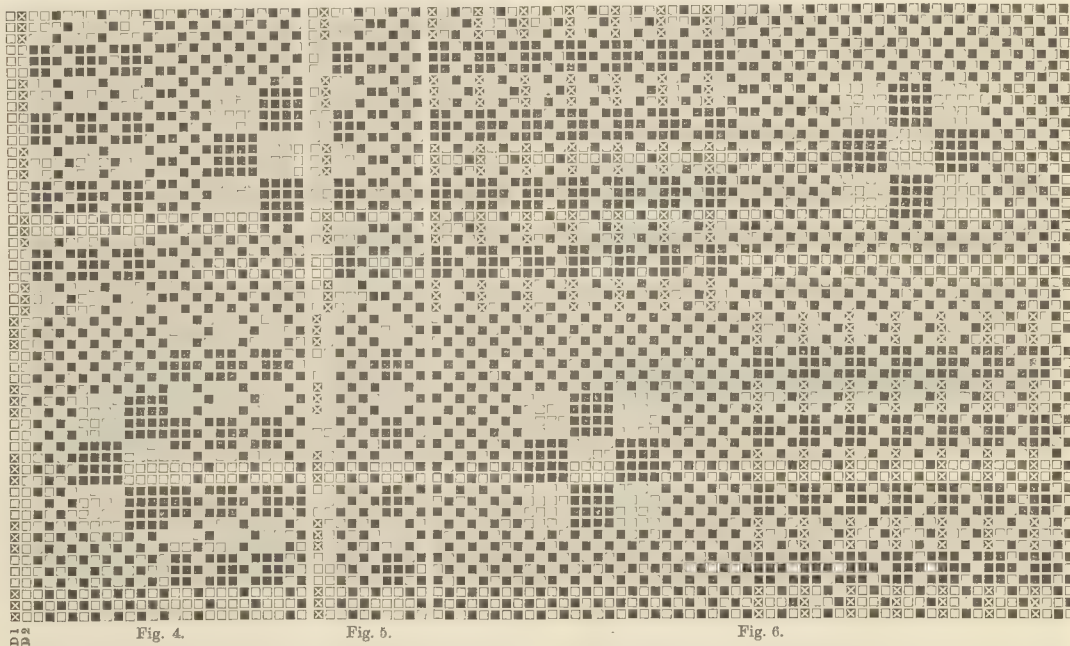
## Weaving Gauze Cloths.

In the following remarks on the weaving of gauze cloths, Figs. 1, 2, and 3 are given on our second separate plate. Fig. 1 is a gauze check, composed of alternate squares of gauze and plain, the plain having a small figure in the centre. The gauze crossing is formed by 2 ends crossing 2 ends and 3 picks in each shed, that is, the doup is lifted for 3 picks in succession, and then Nos. 1 and 2 are lifted for 3 picks, while the two ends that are crossed around work plain throughout, and are arranged in such a manner that, when the crossing takes place, the outside end of the plain is underneath the pick; this is necessary, so that the crossing threads, when passed from one side to the other, are held firmly. If the outside end of the plain was raised when the crossing took place, the crossing ends would be pulled underneath the end, and thus cross over one thread only instead of two. There are 7 sets of 4 threads in each square of gauze, or 28 threads, and 9 sets of 3 picks, or 27. The reason for this is that we must have any number of complete sets of gauze crossing, and in the weft we must so arrange the pattern that the doup is raised immediately the plain ceases and the gauze begins, and we must finish the gauze with the doup up, so that there is a crossing of the threads between the gauze and the plain. This necessitates having an odd number of threes in the weft. Fig. 2 is the draft upon the smallest number of healds possible. If the design or plan (Fig. 1) be examined carefully, we shall find that the first

If this exact pattern must be produced, we should, for simplicity, resort to the douped harness, where we should be able to extend the pattern at will, and where we should have a separate doup for each set of threads. Fig. 6 is the working design for Fig. 1 in a douped harness. In this design, the douts can not be shown at the edge of the design, as in Figs. 4 and 5, but must be shown on each set of threads, although, each set is working the same kind of gauze at the same time. In the design, all the solid squares must be lifted in the ordinary manner, and, where the crosses are shown, the doup must be lifted instead of Nos. 1 and 2. A good cloth for the above pattern would be 2/60's worsted warp, with 64 ends per inch, woven 4 ends in a reed, 1/40's worsted weft, and 56 picks per inch, or, it might be made in similar counts as a cotton cloth, or a pretty effect might be produced by checking it in such a manner that the squares of warp and weft in the centre of the plain would be different colours.

## Protection in America.

An admirable speech was recently given in Leeds by the Right Hon. Sir Lyon Playfair, M.P., for South Leeds, who took for his subject "The Influence of Protection on Wages," with special reference to America. We are always pleased to give both sides of questions in our pages and, without making reference to any opinions of our own, we



two sets of threads, or the first eight, are working plain for 27 picks, the next three sets, or twelve ends, forming squares of weft and warp in the midst of the plain, whilst the 6th and 7th sets are working plain like the 1st and 2nd, the gauze being the same throughout. This being the case, we shall require 1 doup and 4 healds for the first 8 ends, the same doup and another set of 4 healds for ends 9 to 12, and a separate set of 4 healds for the ends 13 to 16, whilst ends 17 to 20 work the same as 9 to 12, and 21 to 28 the same as 1 to 8, one doup being common to all of them—thus we have 1 doup and 12 healds for the first portion of the whole pattern, and, as the second portion is the same, only inverted, we shall require a second doup and a second set of 12 healds, making a total of 24 healds and 2 douts for the complete pattern. Fig. 4 is the pegging plan, or working design, the lifting of the douts being shown in crosses, the whole being on 2 douts and 24 healds, corresponding with the draft. The "slackeners" or "easers" may either be two of the ordinary bars, placed behind the back beam, or the counterpoise heald arrangement. As 26 healds would, in most cases, be more than could conveniently be worked in an ordinary loom, with a dobby, either the pattern would be altered to require fewer healds, or a douped harness would be necessary. If, instead of having the warp and weft squares in the plain check, it was plain throughout, 8 healds and 2 douts would be sufficient, Fig. 3 being the draft for it, and Fig. 5 the pegging plan.

have pleasure in reproducing an abstract of the speech in our pages. Sir Lyon Playfair said that he had lately returned from the United States, where a very important issue had been before the people during the Presidential election. It would be false to call that issue one of free trade, because the proposal was whether the high protectionist tariff, now averaging 47 per cent. on the price of imports, should be reduced to 42 per cent.; but it was the thin end of the wedge, and might be driven home so as to rend in twain the system of protection. The real question before the people of America was whether protection was the source of high wages among the working classes. Nominal wages, which were higher in America than in this country, meant so many dollars or shillings per week, while real wages were the necessities and comforts which could be bought by them. Sir Lyon gave as an illustration the cases of two Bradford men who had discovered that 32s. per week in England went further than 50s. per week in the United States. The Republicans in America, he went on to observe, supported protection, and contended that wages were raised by the system, and maintained at a high level. The Democrats, with some misgivings, had now ranged themselves in favour of a reform of the tariff, and denied that protection influenced wages in any sensible degree. Protection, said the Republicans, created industries which would not otherwise exist, and, therefore, it gave work to labour. The workman did not, however, live to work; he

Great empire of the West,  
The dearest and the best,  
Made up of all the rest.

The law of supply and demand ruled wages in America as it did in England. There were ten unprotected workmen to every protected one in America. Was it not obvious, when the unprotected industries competed for the ten men, and the protected industries for one, that it must be the former, and not the latter, which determined the rate of wages? Of the unprotected industries, agriculture was much the most important, and protection had absolutely nothing to do with that, except as a force which lowered the rate. The State of Maine was occupied with the lumber and other trades fully protected, and its average wages were £82 yearly, while California, with its farms and orchards, having no protection, had an average wage of £96. We saw exactly the same thing in our new colonies when they possessed large tracts of virgin soil. Australia was an excellent example, because there, side by side, were a colony with a policy of protection and another with free trade. Victoria enjoyed protection, whilst New South Wales had adopted the

The Manufacture of Saleable Fabrics.

Manufacturers of textile fabrics of every variety are much puzzled as each fresh season comes round, as to what they shall pay their attention in the getting up of fresh patterns, or of new cloths. There is no doubt that this forms a problem most difficult to solve. If we take Brussels, tapestry, or Kidderminster, carpets as an example, there is little scope for great departures either in the style of the fabric or in that of the design. Yet, as each season comes round, there must be something attempted, and something done, in order that looms may be kept running. The same remarks apply equally to other fabrics, such as curtains, whether of tapestry, lace, damask, or printed materials; dress materials, whether of silk, satin, woolen, or cotton; counterpanes; table covers, of tapestry or linen; materials for gentlemen's wearing apparel, and, in fact, to every variety of cloth, whether the novelty is gained in pattern, or by the structure of the fabric. There have been many innovations in the manufacture of carpets, not the least of which have been connected with those known as Kidderminster. Every one will remember the old style in which the colours necessary to form a pattern lay in broad stripes and patches. Place a carpet made at the present time with one of these, and what an improvement will be noticeable. There is a firm in Leeds, prominent for the high standard of their carpets of this class, but this improvement has been a matter of time and careful practical study. In Brussels and tapestry carpets also, there have been many improvements from time to time, some of which have been noticed in our pages. As an example, may be mentioned the patent of Messrs. Brinton and Co., of Kidderminster, for the making of carpets of different shades of natural wool, which is now prominently used in the manufacture of clothing and other fabrics. There is also another novelty, having special reference to carpets, by which the surface of the fabric has a variegated, soft lustre effect, whilst Axminster carpets have received attention from manufacturers. Perhaps, one of the most important inventions was that by the aid of which carpets, four yards wide, with a border on each side, could be manufactured in a loom. This was the invention of a noted Halifax firm. In counterpanes and such fabrics, the Bolton firms have made many important improvements, amongst the most successful of whom are Messrs. Barlow and Jones, some

of whose improvements we have noticed in our pages. The manufacture of tapestry fabrics for curtains, table covers, and upholstery purposes, appears to have declined to that point where the chances of a reasonable profit, combined with a sufficiency of orders to keep hands fully employed, are almost *nil*, and, therefore, producers are turning their attention to the production of some material to supersede this. A short time ago, a prominent man in the trade was bewailing to us the lack of something new in this line, and he is by no means the only one. The competition of foreign makers, who pay less wages for longer hours, and who also lower the standard of the fabrics turned out, has, perhaps, caused our manufacturers to attempt continued reduction in price and quality until there is no further margin to cut upon. Thus, the trade is unprofitable, and one and all would be glad to turn their looms to better account. There is, however, an exception in a novel tapestry fabric now being made, to which we refer below. In lace goods, particularly curtains, and in linen cloths, there is, perhaps not as wide a scope for departures as in many other fabrics, whilst in dress goods, manufacturers have been bestirring themselves, and we now see some of the most beautifully ornamented fabrics, as there is at the present time great taste displayed in the manufacture of dress materials, for, in point of design, there is no lack of choice in style—indeed, it is almost impossible for one to go on the wrong track, especially if stripes are omitted, which seem to have had their day as far as first-class materials are concerned. Check patterns, in all materials, which, in the past, have so frequently taken the popular taste, are likely to come again upon the market in a variety of fabrics, whilst woollen fabrics and silk foulards, as well as cotton goods, will be ornamented by bouquets of flowers, tied together with ribbons; by clusters of hanging fruit with their leaves, accompanied by arabesques; and by garlands of many-coloured flowers. Damasked fabrics will also continue to receive a fair amount of attention, and nothing can be prettier than some of the bordered fabrics now in great demand. These have a wide range, in fact, no pattern seems inappropriate, whilst the colours and shades employed in the designs vary from two or three to half a dozen or more. In many cases, both broad and narrow borders are made to correspond with a plain material. In fabrics for gentlemen's wearing apparel, it is difficult to produce anything new, and, where this end has recently been attained, it has been, generally, in the make of the cloth and not in the pattern. We have scarcely reached the time when distinct ornamental fabrics will be accepted for the personal adornment of gentlemen, although one hears of certain specimens of manhood airing themselves in garments, covering the lower extremities, containing a stripe down each side, of an ornamental and variegated description. But such a fashion will be generally considered too absurd for serious consideration. We have, on one or two former occasions, given a few ideas of our own upon novelties, some of which we have had the pleasure of seeing adopted and acted upon by manufacturers. In curtain materials, whether of lace, tapestry, damask, or printed cloths, a pleasant innovation might be introduced by composing a pattern in the following manner. The design should consist of the usual border from top to bottom, and a deep band, say, of not less than a yard, should run across the centre of the curtain, or sufficiently high for the eye to rest upon it. The remainder of the curtain above and below this band should consist of the usual all-over or repeating pattern, and where practicable the side border could also run across the bottom. It may be urged that such a band would be too prominent, but this depends upon the manner in which it is treated in point of design and colouring. The beauty of a dado is lost on account of its being so low, and, therefore, if a design were treated in the above manner, the principal ornamentation would come directly under notice. We should suggest the employment of a deep band of ornamentation similar to that of the body, but much bolder, and which should break into the latter—top and bottom, without any dividing bands or lines, the colouring also being similar throughout. A tapestry fabric is now being manufactured which has a novel appearance. The designs are similar to those in general use, but provision is made for the floating of the warp in any desired manner. Thus, it may be floated here and there, or zig-zag, waved, or vandyked, or in horizontal or diagonal stripes. When the loose yarn is cut at the bottom, a fringe is formed, which can be left in single strands, or twisted, or knotted, to form tassels. Many very good effects may be gained in a fabric constructed in this manner, a design for which we give on our first separate plate as a specimen. In carpets, a nice effect could be obtained by having a three-quarter yard border of tasteful design and colouring, with a body of a moresque—mottled, or marbled, effect. The departure in this case would consist in the breadth of the borders. Too much of the effect of these is lost when furniture is placed upon them, but, if made of extra width, this would be, to a great extent, prevented, and a pleasing result would be produced. We have made reference to the style now fashionable for dress materials, and we consider this style is even capable of wider application. Ornamental panels might be manufactured as well as wide and narrow borders in various shades of grounds harmonizing with, but differing from, the plain cloth. It appears to be considered by some in the trade that the style will not last long, but this should be proved an erroneous idea, providing border material may be had separate from the plain cloth, a method not generally adopted. The panels above alluded to might be for the adornment of skirts or, in smaller sized patterns, as vests for ladies' dresses. Manufacturers, just now, are looking eagerly for a good

mantle cloth—a fabric not very easy to obtain. Ornamentation has, in this class of cloth, played a considerable part, from time to time, not only in silks and velvets, but in worsted and woollen cloths, and, perhaps, in the present instance something new in the structural arrangement of the cloth would be most eagerly welcomed.

### New Dyes and Colours, for Dyeing, Printing, &c.

The greater portion of the patented dyes now used in this country and on the Continent seem to be of German origin, and, during the present year, the crop of new colouring matters from that country has been unusually large. Particulars of some of the later productions will, we are sure, be of interest to a large section of our readers. Amongst the patents are many for the manufacture of azo dyes, the following being for the production of dyes, of from light to dark blue black colour, which are capable of dyeing cotton goods in an alkaline bath by direct action, without the employment of a mordant, and it consists essentially in combining the tetrazo compounds of para diamines, or of their sulpho- or carbo-acids, with alpha Naphthylamine in the first place, the amido azo compounds thus obtained being again diazotised and caused to act upon amides, phenols, or the sulpho, or carbo, acids thereof. According to this invention, violet blue to blue black direct dyeing azo dyes are manufactured by the action of the tetrazo compounds of those amido azo compounds which result when one molecule of the above-mentioned paradiamine is diazotised and combined with one or two molecules of alpha naphthylamine, two molecules of alpha or beta naphthol dioxy-naphthaline, or their mono and disulpho acids, or the aforesaid tetrazo compound is caused to act upon one molecule of an amide, a phenol, or their sulpho, or carbo, acids, so as to obtain an intermediate product which contains a free diazo group and is, consequently, capable of combining with a second molecule of another amide, or phenol, or the sulpho, or carbo, acids thereof to form a dyestuff. Blue black dyestuffs are manufactured from acetyl para phenylenediamine and acetyl diamido azo benzol by combining the diazo compounds of this substance with one molecule of alpha naphthylamine and, repeatedly, diazotising the same, and bringing it into contact with amides, phenols, or the sulpho, or carbo, acids thereof—the acetyl group being afterwards separated by known means, then repeating the diazotising, and again combining with amides, phenols, and their sulpho, or carbo, acids. The following description explains the application of the invention to the production of certain dyestuffs by way of example, from which the method of proceeding in order to obtain others of the same class or series will be readily understood by those skilled in the art. Dye obtained from benzidine—One molecule alpha naphthylamine and two molecules alpha naphthol alpha mono sulpho acid, about one hundred parts by weight of benzidine sulphate in a fine state of division are placed in suspension in water and mixed with about fifty parts by weight of hydrochloric acid at 21° Beaumé. This solution is cooled by means of ice, and a solution composed of twenty-five parts by weight of sodium nitrite in twenty-five parts by weight of water is poured slowly into it. This solution is then mixed with an aqueous solution of about twenty-six parts by weight of alpha naphthylamine in weak or highly diluted hydrochloric acid, and the free mineral acid is neutralized by rapidly introducing a solution of sodium acetate. The mixture then assumes a brown colour and is allowed to stand until a drop of the deposit upon blotting paper leaves a colourless ring which does not show any colour on the application of an alkaline solution of naphthol sulpho-acid. The deposit thus formed is separated by filtration, and stirred with water into a thin paste. About fifty parts by weight of hydrochloric acid at 21° Beaumé are then added and the second diazotising is performed with the application of about thirteen parts by weight of sodium nitrite. After standing for about twelve hours, the diazo compound thus obtained is poured into a solution, maintained alkaline to the last with soda, and consisting of about eighty-eight parts by weight of a soda salt of alpha naphthol alpha mono sulpho acid. A blue black deposit, or precipitate, is then formed which, when separated by filtration and dried, forms a dyestuff, by means of which cotton can be dyed a blue-violet colour, being bluer than that obtained with the dye produced with the employment of one molecule of benzidine and two molecules of alpha naphthol alpha mono sulpho acid. Dyestuff obtained from benzidine with one molecule of alpha naphthylamine, one molecule of alpha naphthionic acid and one molecule of alpha naphthol sulpho acid. When the diazo compound of the intermediate product of benzidine, and one molecule of alpha naphthylamine, described in the preceding example, are poured into a solution of a quantity of a soda salt of an alpha naphthionic acid, (alpha naphthionate of soda) corresponding to one molecule, (or about forty-two parts by weight) and acetate of soda is added until the mineral acid has disappeared, a brown precipitate, or deposit, is obtained after standing for some time, which precipitate also contains a free diazo group, and combines with naphthol sulpho acid to form dyestuffs of from red to blue-violet colour. Dyes with two molecules of alpha naphthylamine and two molecules of alpha naphthol sulpho acid. When, in the process firstly hereinbefore described, two molecules of alpha naphthylamine are employed in place of the one molecule above referred to, and are allowed to act upon the diazo compound of the benzidine, that is to say, when about fifty parts by weight of alpha naphthylamine are allowed to act upon about one hundred parts by weight of diazotised benzidine sulphate, a known amido azo substance, insoluble

in water, is obtained. After standing for about twelve hours, this substance is separated by filtration, and washed with water, slightly acidulated with hydrochloric acid, in order to remove all excess of hydrochlorate of alpha naphthylamine, after which it is mixed with a small quantity of water, with the addition of about fifty parts by weight of hydrochloric acid, at 21° Beaumé, and about twenty-five parts by weight of sodium nitrite in solution in water. After again standing for about twelve hours, a diazo compound, soluble in water with great difficulty, is formed, which yields a blue black precipitate on being poured into a solution, maintained alkaline to the end, of about eighty-eight parts by weight of a soda salt of alpha naphthol sulpho acid. By boiling, filtering, and drying, this product, a dyestuff is obtained of a beautiful blue black colour. Dyestuffs from benzidine and two molecules of alpha naphthylamine, the product being treated with sulphuric acid and then, after, diazotizing with two molecules of alpha naphthol sulpho acid. A very excellent and beautiful blue black dyestuff is obtained by the following process:—When the well-known insoluble dye, obtained by the action of two molecules of alpha naphthylamine upon diazotised benzidine, is rendered soluble by treatment with sulphuric acid, and the product from about one hundred parts by weight of benzidine sulphate is then treated in the known manner, being dissolved in water and mixed with about fifty parts by weight of hydrochloric acid at 21° Beaumé, and about twenty-five parts by weight of sodium nitrite in solution in water, a diazo compound is obtained, which is soluble with difficulty and, after pouring, or flowing, into an alkaline solution of about eighty-eight parts by weight of a soda salt of alpha naphthol mono sulpho acid, yields a dye which dyes the goods a deep blue to black. Tolidine yields a somewhat weaker, and dianisidine a still less useful, product. Dye from para-phenylene-diamine and diamido azo benzol. In making this dye, it is preferable to apply the acetyl combinations of mono acetyl para-phenylene-diamine and mono acetyl diamido azo benzol, but this is not absolutely essential. Alpha naphthol sulpho acid, azo benzol azo naphthaline, azo alpha naphthol sulpho acid. About fifty parts by weight of acetyl para-phenylene-diamine are dissolved in about eight hundred parts by weight of water and about fifty parts by weight of hydrochloric acid at 21° Beaumé. Into this mixture is slowly poured a solution of about twenty-three parts by weight of nitrite. After standing for from about one to two hours the formation of the diazo compound is completed and this product is poured into a solution of about forty-seven parts by weight of alpha naphthylamine in highly diluted hydrochloric acid. The product of reaction forms very rapidly and, in a few hours, the liquid thickens and becomes a stiff paste. In order to remove any alpha naphthylamine that may have remained unconverted, filtering is performed after standing for about one hour, and the product is repeatedly washed, or elutriated, in water acidulated with hydrochloric acid. The azo substances thus treated are then washed, or elutriated, with about seven hundred parts by weight of water, and about fifty parts by weight of hydrochloric acid at 21° Beaumé, and mixed with an aqueous solution of about twenty-three parts by weight of nitrite. After standing for about twenty-four hours, the diazo compound formed is poured into an alkaline solution of about eighty parts by weight of a soda salt of alpha naphthol sulpho acid. In order to separate the acetyl group from the dye which is immediately formed, the product is filtered and washed, or elutriated, with about one thousand parts by weight of water, and heated to boiling, with the addition of about two hundred parts by weight of soda lye, at about 35° Beaumé. After simmering for about two hours, the separation of the acetyl group is completed. The dissolved soda salt of para-amido benzol azo naphthaline azo naphthol sulpho acid forming a fine blue dyestuff is mixed with a watery solution of about twenty-three parts by weight of nitrite, and about fifty parts of hydrochloric acid, at 20° Beaumé, and allowed to stand for about twenty-four hours. The resulting diazo compound is placed in a solution of about eighty parts by weight of alpha naphthol sulpho acid and about one hundred parts by weight of soda in about five thousand parts by weight of water. A dyestuff is immediately obtained, giving a very fine indigo-blue colour. Dyestuffs from amido benzol azo giving a very fine indigo-blue colour. This substance is very readily obtained from para-amido benzol. When the para-phenylene-diamine is diazotised phenylene-diamine. When the para-phenylene-diamine is diazotised in a strong hydrochloric acid solution, being well cooled at the time, and the solution in the highest degree of concentration is poured into three times the quantity of aniline, corresponding to the nitrite contained therein, the diazo amido compound is formed after stirring the mixture for a certain time. After standing for about twenty-four hours, a small quantity of aniline and hydrochloric acid is added, and the temperature is raised to about 40° centigrade. The entire transformation or conversion of the diazo amido compound into the amido azo compound is completed. The product is separated by filtration, elutriated with hydrochloric acid, and filtered again to remove any aniline that may be present, after which, by the addition of ammonia, it is changed into the yellow base. Production of the dyestuff alpha naphthol sulpho acid azo naphthalin azo benzol azo benzol azo benzol azo naphthalin azo alpha naphthol sulpho acid. About one hundred parts by weight of amido benzol azo benzol azo amido benzol are elutriated with about one thousand five hundred parts by weight of water and one hundred parts by weight of hydrochloric acid at 21° Beaumé. A watery solution of about forty-four parts by weight of sodium nitrite is then poured into this mixture, the latter being effectually cooled. To complete the formation of the diazo compound, the liquid is allowed to stand for about twenty-four hours, and a weak hydrochloric acid

solution of about ninety parts by weight of alpha naphthylamine is poured into the resulting diazo compound. The formation of the products of reaction proceeds very rapidly when the free mineral acid is neutralized by acetate of soda. It is then acidulated with hydrochloric acid, separated by filtration, and elutriated with water, containing hydrochloric acid, to remove the alpha naphthylamine. The new azo substance is suspended in about one thousand parts by weight of water and about one hundred parts by weight of hydrochloric acid at 21° Beaumé, a solution of about ninety parts by weight of nitrite being added. After standing for about twenty-four hours, the diazo compound formed is caused to flow into a solution of about one hundred and sixty parts by weight of the soda salt of alpha naphthol sulpho acid maintained alkaline by soda. The dyestuff which is immediately formed produces a grey black. In all these examples, there may be employed in place of the tetrazo compounds hereinbefore specified any other para-diamine—such as benzidine, tolidine, diamido diphenol ether, diamido stilbene, diamido fluorene, diamido azo benzol, diamido azo toluol, diamido azo xylol, phenylenediamine, amido benzol azo benzol, azo amido benzol, naphthylene diamine, or the sulphones, sulpho acids, or carbo acids thereof.

### The Proposed International Exhibition in Leeds.

The Committee, appointed in August by the Leeds Town Council to consider and report upon the advisability of holding an International Exhibition in Leeds, met at the Town Hall a few days ago, when a discussion on the subject took place. We should like to see the project handled with a little more spirit, for we can see no reason why such an undertaking should not be carried to a successful issue. Some of the speakers considered otherwise, and it appears to us that there is a great contrast between the manner in which the project has been taken up in Leeds and that with which a similar project was hailed in Manchester, and brought to such a satisfactory conclusion. We have most important and varied industries in this County of Yorkshire which, without the assistance of exhibitors outside the county, would secure a grand display. We have a large population, besides which, Leeds is in direct communication by rail with all parts of the country. Certainly, one or two large Exhibitions have been closed with a loss, but we cannot see that, with proper management, such could be the case in Leeds. The Mayor of Leeds, in opening the proceedings, said "the town of Leeds offered special facilities for the holding of an Exhibition. So far as railway accommodation was concerned, the town possessed everything requisite, and the varied trades of the town, especially the textile industries, would form a fitting Exhibition in themselves. In addition, there was the iron industry, the products of which would also form a considerable element in an Exhibition. The one question that seemed to him more particularly for that meeting to consider was whether the present time was opportune for an Exhibition. The year 1890 had been mentioned. During that year, the British Association would hold its meeting in Leeds, and it was urged that an Exhibition then would tend to the benefit of Leeds commercially." Alderman Spark considered that "Leeds did not move as quickly as other towns and was, therefore, behindhand in many important matters. The Manchester, Edinburgh, and Glasgow Exhibitions had answered all expectations. Within 30 or 40 miles of Leeds is a population of nearly 2,000,000. In whatever light they regarded the question, an Exhibition should not be a loss. The one held in Leeds in 1875 produced a surplus of £7,000, which went to the Mechanics' Institute." Mr. T. D. Yates remarked "that the Chamber of Commerce which he represented, had not had an opportunity of expressing its opinion upon the matter. It was intended, however, to ascertain the views of the commercial community, which the Chamber of Commerce represented, with regard to the subject. If an Exhibition were held, it ought to be made a success." Sir James Kitson said "that people engaged in the iron industries of Leeds thought that Exhibitions were rather costly, and that it was doubtful whether the results were commensurate with the outlay." Alderman Woodhouse confessed that "he was not very enthusiastic about the suggested Exhibition," whilst Colonel Harding said "he must admit that he came to the meeting unwilling to support the proposal, and that the commerce of the Borough, he was inclined to think, did not require an Exhibition." We are disappointed in finding such men as Sir James Kitson, Alderman Woodhouse, and Colonel Harding exhibiting so much apathy on the subject, we had hoped that they would have been prominent in pushing the project to a successful issue." But one thing struck us in the discussion—the matter appeared to be considered too much from a "Leeds" instead of a "County" point of view, for we have no doubt the whole county would be interested in the Exhibition, the local only being "Leeds." Is it not advisable, therefore, that the Committee, at its next meeting in January, be augmented by a few gentlemen outside Leeds who would have interests at stake in the carrying forward, or the dropping, of the project. We hope the scheme may be pushed on to a successful issue, and towards this end we are quite sure that every effort would be made by the proposed Manager, Mr. Lee Bapty, who, as general manager of the Manchester Exhibition, was greatly instrumental in bringing it to such a satisfactory conclusion. We also notice that Mr. Bapty, as British Commissioner at Brussels Exhibition, has earned the thanks of the exhibitors, as is testified by the meeting held a few days ago for the purpose of considering the presentation to him of a testimonial, subscriptions to a considerable amount being obtained.



## ORIGINAL DESIGNS.

On our first plate is a design for a Tapestry Fabric, to which reference is made on another page under the heading of "The Manufacture of Saleable Fabrics." The fringe and tassels are made by allowing the warp to float for the required distance, and then cutting it at the bottom. Our Mr. R. Lord has drawn this design.

Our second plate contains a design illustrating a short article on "The Weaving of Gauze Cloths," which will be found in these pages.

On our third plate, we give a design for a Linen Damask Table Cover, drawn by Mr. W. Sandiforth, Racecommon Road, Barnsley.



## MONTHLY TRADE REPORTS.

**WOOL.**—At the London sales, the French, German, and home, trades' buyers have been largely represented, particularly the first named, and biddings, especially for the better classes of wools, have been exceedingly brisk, and prices have ruled from  $\frac{1}{4}$ d. to 1d. per lb. higher than at the last sales, the tendency of rates at the close of the month being upward. It was fully expected that the markets in the country would be in sympathy with the sales, but prices generally have been but slightly affected. In English wool, a fairly consumptive business has been done during the month at firm rates, but spinners have bought little outside their actual requirements, preferring to satisfy their absolute needs to buying on speculation. The yarn trade has shown but slight variation from our last report, new business having been at recent prices, any tendency to higher rates having had the effect of stopping the giving of orders. Botany yarns have been firmer in price, and spinners of these are generally busy. In the piece branches, although manufacturers are, at present fully occupied, new orders have come in rather slower, this being mostly the case in goods for the Eastern markets, and in worsted coatings of the plain makes.

**LACE.**—There have been no signs of a revival of this branch of industry. In nearly all departments there has been the same quietness that we have reported for some months past. Profits, except for special goods, have been absolutely nil, and foreign competition is as keen as usual. The curtain branch has shown no new feature, there being much machinery standing idle, and the prospect of an early resumption of work for them seems remote. The business done in laces has mostly been in the lower grades, expensive goods having been utterly neglected. Prices generally are about as last report.

**COTTON.**—In some departments of the market a decided revival of demand has occurred during the past month. In others, however, scarcely any improvement of this kind has been experienced. Frequently, too, the producer's margin has increased somewhat. Moreover, the tone of the market has become rather more hopeful, and even where no substantial amelioration can yet be spoken of, the future is regarded more cheerfully than before. India merchants have surpassed all other buyers in activity, and, although their operations have not extended equally to all kinds of staples suited to their markets, they have done much to put producers of shirtings, dhooties, and some classes of jaconets into a fairly strong position. Some considerable buying for China has also been met with at times. Generally, indeed, it may be said that the Eastern departments have shown greater activity than had been experienced for two or three months previously. This accession of business has been brought about, partly, by some increase in the previously low offers of buyers, and, partly, by concessions made by the sellers. The motives for the latter have been sometimes the simple need of manufacturers for fresh business, and sometimes the prospect of freer cotton supplies, and some giving way in the prices of American cotton.

**WOOLEN.**—In this branch of industry, manufacturers have been mostly busy in getting out old orders, and showing new patterns. The new samples (especially those of a high class character, either in worsted or woollen), have met with an encouraging reception, and good orders have been the rule at advanced rates; also in the medium and lower qualities of goods, a favourable business has been done, and the prospects for the new year are consequently bright. In the heavy woollen district, the trade done during the month has been satisfactory, and, generally, manufacturers are hopeful of a continuance of this state of trade. Makers of cloths for the clothing trade, when the recent mild weather is taken into account, have done fairly well, and stocks on hand are only light. Prices of most descriptions of goods have ruled higher, and, at the close of the month, the tendency was still upward.

**LINEN.**—There has been but slight variation in demand since last month; in some branches, a little more has been done, and in others rather less. The demand for table damasks has been below the average, and there are many looms standing idle that should be employed on these goods. A fair business has been done in towellings, tea, glass, and such like fabrics, and some good things in these goods, in point of pattern, are now being manufactured. Prices generally are at a low ebb, and there is much complaint of the keen competition.

## Messrs. Hutchinson, Hollingworth and Co.

Messrs. Hutchinson, Hollingworth and Co., of Dobcross, have just added to their former presentations to the Textile Industries Department of the Yorkshire College an improved Hollingworth and Knowles' patent open-shed quick-running loom. The loom in question has been working in the Glasgow Exhibition, and combines in its construction simplicity of mechanism with exactness of motion, which varied experience in loom building has suggested to this well-known firm of loom makers. It is equipped with every contrivance for ensuring perfect action in the motive parts, and for facilitating the production of a uniformly woven cloth. Many of the minor gearings with which it is supplied diminish the difficulties arising in quick weaving, and also remove the causes of those accidents which lay at the basis of faulty work. The design or pattern scope of the loom is 36 shafts, and there are four boxes at each end of the going part, controlled by the same mechanism as the shedding contrivance, securing uniformity of action between these all-important motions. As regards the finish and workmanship of the loom, these are all that could be desired. Those parts which are specially subjected to wear and strain are made of tempered steel at all working and contacting points, thus combining the three essential elements of machine design, namely, strength, lightness, and durability. All the motions are well arranged and positively controlled. The tension of the warp may be regulated with the utmost nicety, and may be constantly maintained at the same degree of tightness, while, by a system of change wheels, the speed of the loom at a moment's notice can be varied one-third. In the weaving room at the College, Professor Beaumont, in order to test the weaving capacity of the loom, has had it mounted for producing a series of styles in stout cloths for Scotch modes. The presentation does credit to the firm from which it emanates, whether regarded as a specimen of excellent weaving machinery or as a loom adapted for manufacturing fancy woollen and worsted cloths, in which department of the textile industry it has already obtained a high position both in this and foreign countries.

## Messrs. John Downham and Co.'s New Engineering Works.

A few days ago these works at Bury were completed and equipped with most of the machinery required. In celebration of the event, about 200 people were entertained by the firm, and, after refreshing the inner man, spent an enjoyable evening, the programme including songs, glees, instrumental music, and speeches. A short reference to the works may be interesting. The main building is 150 feet long by 60 feet wide, having a gallery along one side 150 feet by 25 feet. A 10 ton crane, made by one of the first Manchester firms, containing all the latest improvements, spans that part of the works not occupied by the gallery, giving a range of 150 feet by 35 feet for erecting purposes and for heavy tools requiring lifting power for the work done in them. The works have been fitted with turning lathes and drilling machines by two of the most eminent firms in Manchester. A steam hammer has been supplied by a Leith firm, and the smithy fires are blown by one of Root's patent blowers. There is also in course of construction for Messrs. Downham and Co. a planing machine, 24 feet by 4 feet by 4 feet, which they are expecting to receive in a few days. The shop floor is covered with 3 inches creosoted planks, giving a level surface for erecting upon, and being much warmer than a flagged floor. The light lathes and drilling machines not requiring the crane are placed under the gallery. On the gallery is the pattern making room with the drawing offices, commanding a view of almost the entire shop. The motive power is supplied by a horizontal condensing engine, made by Bolton engineers. The steam boiler is of Siemens's steel plates, and is insured to work at 100 lbs. pressure to the square inch.

Visitors to the Glasgow Exhibition will have noticed the very fine display of engines in the Electric Light Department. Prominent amongst these, and distinguished by the simplicity of its construction, and the remarkable smoothness of the running, was an engine of about 300-horse power, by Robey and Co., of Lincoln, the only engine from Lincoln in the Exhibition, and a very fine example of first-class work. Few people who have not seen it would have believed that such high-class machinery, and of so large a size could have been produced in Lincoln shops, which, up to a few years ago, were associated only with agricultural machinery. We are glad to learn that the engine in question is to remain in Glasgow, having been purchased by one of the celebrated firms of that city, Messrs. J. and G. Thompson, engineers and shipbuilders, Clydebank, Glasgow, for their own use. Considering the number of engine builders there are in Glasgow, many of whom had engines in the Exhibition, it is a high compliment to Lincoln, and to Messrs. Robey's productions, that their engine should have been purchased by so eminent a firm of Glasgow engineers.

**CHAS. L. BAKER & CO., Ltd.,**

Cornbrook Telegraph Works, MANCHESTER.

# ELECTRIC LIGHT.

MILL LIGHTING A SPECIALITY.

Manufacturers of Dynamos, Arc Lamps, Switches, etc., etc.

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Mills fitted with Electric Bells, Fire Alarms, Lightning Conductors, Engine Stopping Signals in case of Accidents.

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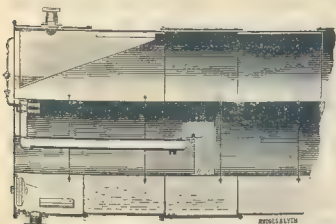
Telephone No. 171.

Manchester Exchange, No. 6 Pillar, 1-30 to 2-30.

**HOLDEN'S PATENT**

**Assisted Draught Furnace & Smoke Preventer.**

FOR LAND OR MARINE BOILERS.



Among the advantages secured by this Furnace are the following:—

- Renders combustion less dependent at all times on the action of the chimney.
- Increases the Draught in the Ashpit, quickening and more thoroughly supporting the combustion of the solid fuel.
- Supplies and effectively distributes and diffuses a constant current of heated air above the fires, effecting the instant combustion of the gases arising from the solid fuel.
- Secures absolute prevention of smoke.
- Elicits the highest heating power of the coal, and develops the maximum power of the boiler.

In describing the working of the **HOLDEN FURNACE** on Four Lancashire Boilers in London, Perry F. Nursey, Esq., C.E., Ex-President of the Association of Engineers, states in "IRON," of July 6th, 1888, that:—"The coal used is **HARTLEY MAIN**, a CAPITAL SMOKE PRODUCER, but, on firing up the Furnaces, all that could be detected were some **THREE** or **FOUR** SHORT PUFFS of VERY FAINEST BROWN SMOKE, which the Smoke Abatement Society would probably have designated No. 0. SHADE of their scale, FOR IT CERTAINLY DID NOT REACH WHAT WE HAVE SEEN DESIGNATED AS THEIR No. 1 SHADE. A 70 LBS. STEAM PRESSURE was not only easily maintained, but HAD NOW AND THEN TO BE KEPT IN CHECK, AS IT MADE THE RUN TO 76 AND 78 LBS.

"The ASSISTED DRAUGHT FURNACE is simple in construction, does not necessitate any radical change in the Boiler, and requires no skill to work it. WE CONSIDER IT TO BE A RATIONAL AND PRACTICAL METHOD OF DEALING WITH THE PROBLEMS WHICH IT HAS SUCCESSFULLY SOLVED."

The "PRACTICAL ENGINEER," of August 17th, 1888, says:—"The combination of regenerative heating of the air supply with the perfect regulation of draught ENABLES THE EVAPORATIVE EFFICIENCY OF THE BOILER TO BE DEVELOPED TO ITS FULLEST EXTENT, WHILE IT SECURES, AT THE SAME TIME, PERFECT COMBUSTION AND ABSENCE OF SMOKE."

Messrs. G. H. HOLDEN & CO. are also Makers and Patentees of all kinds of Winding and Twisting Machinery for all Fibres, which may be seen in operation at their Exhibition Rooms.

CARR STREET, BLACKFRIARS STREET, MANCHESTER,

FIVE MINUTES' WALK FROM VICTORIA AND EXCHANGE STATIONS, AND TWO MINUTES' FROM THE EXCHANGE.

# J. H. RILEY & CO., BURY, near Manchester.

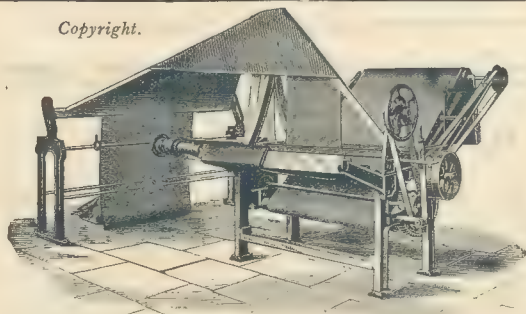
## Specialities.

**RILEY'S PATENT FULL WIDTH  
BURR EXTRACTING OR CARBONISING MACHINE**  
for Dyed and Undyed Woollen Goods.

**WET FINISHING MACHINE**  
for Bradford Dress Goods.

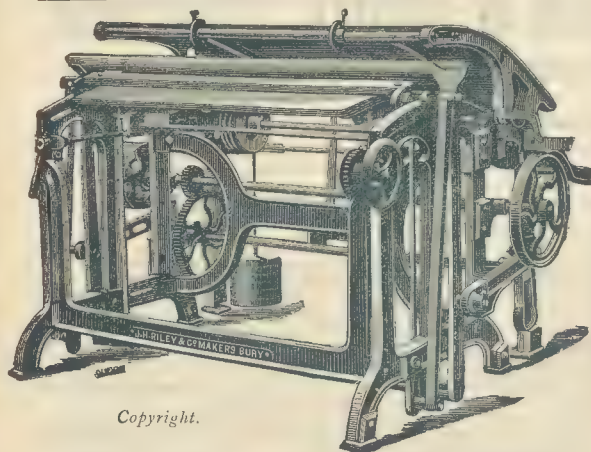
**CALENDERS** for Satteens, Italians, and every class of Textile Fabrics.

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## ELDER & RILEY'S PATENT RIGGING MACHINE

for Stuffs and Woollen Cloths, as supplied to Her Majesty's Clothing  
Depôt, Pimlico, and to the Indian Government. References to a  
large number of machines at work.



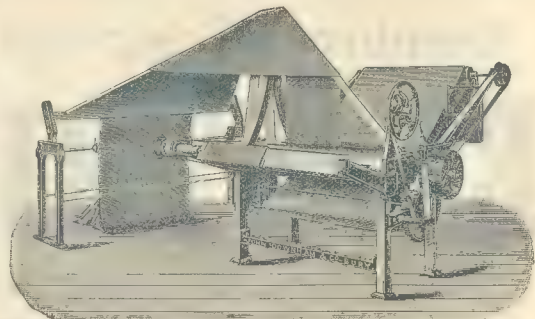
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## RILEY'S PATENT GRIP CUTTLING MACHINE

For Single and Doubled Woollens, the best and strongest Machine made.  
We have some scores of these machines at work.

**J. H. RILEY & CO.,  
BURY, NEAR MANCHESTER.**

# JOHN DOWNHAM & Co. BURY, near Manchester.



## ELDER'S RIGGING MACHINE, WITH DOWNHAM & CO.'S PATENTED IMPROVEMENTS,

For Doubling all kinds of Woollen and Worsted Goods lengthwise.

## IMPROVED CUTTLING MACHINES

For Folding Single and Double Woollens and Worsteds.

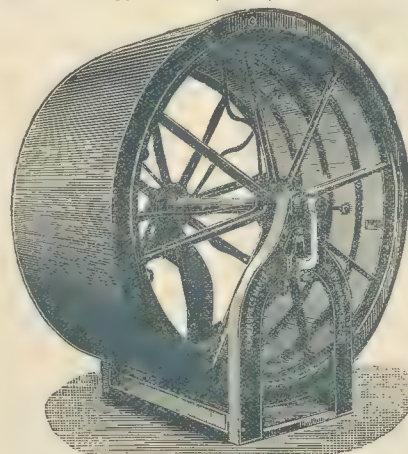
## STEAM DRYING MACHINES, WITH TIN AND COPPER CYLINDERS,

Calenders, Beetles, Dye Becks, Dye Jigs, &c.  
Prices and Drawings on application.

## J. H. PICKUP & CO., (Successors to JAMES ANKERS)

## TIN-PLATE WORKERS, COPPERSMITHS, &C.,

**Britannia Works, BURY, near Manchester,**  
**Makers of every description of Tin, Iron, Zinc, Brass & Copper Goods,**  
For Machinists, Cotton, Woollen and other Mills.



Tin Rollers for  
Ring Frames,  
Mules, Throstles,  
Winding and  
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We have made a  
speciality in Tin  
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the importance of  
Machinists and  
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ing a good and  
true Roller to run  
the speeds that  
are now required.  
Our Rollers are  
made from the best  
sheets, and put  
together by very  
efficient workmen.

## LARGE STEAM DRYING CYLINDERS,

Any diameter up to 12-feet, and any length, either in Tin or Copper.

**SINGLE CASED OR CAVITY CYLINDERS made on the most approved principle.**  
ESTIMATES ON APPLICATION. REPAIRS PROMPTLY ATTENDED TO.

THE JOURNAL OF FABRICS AND TEXTILE INDUSTRIES.

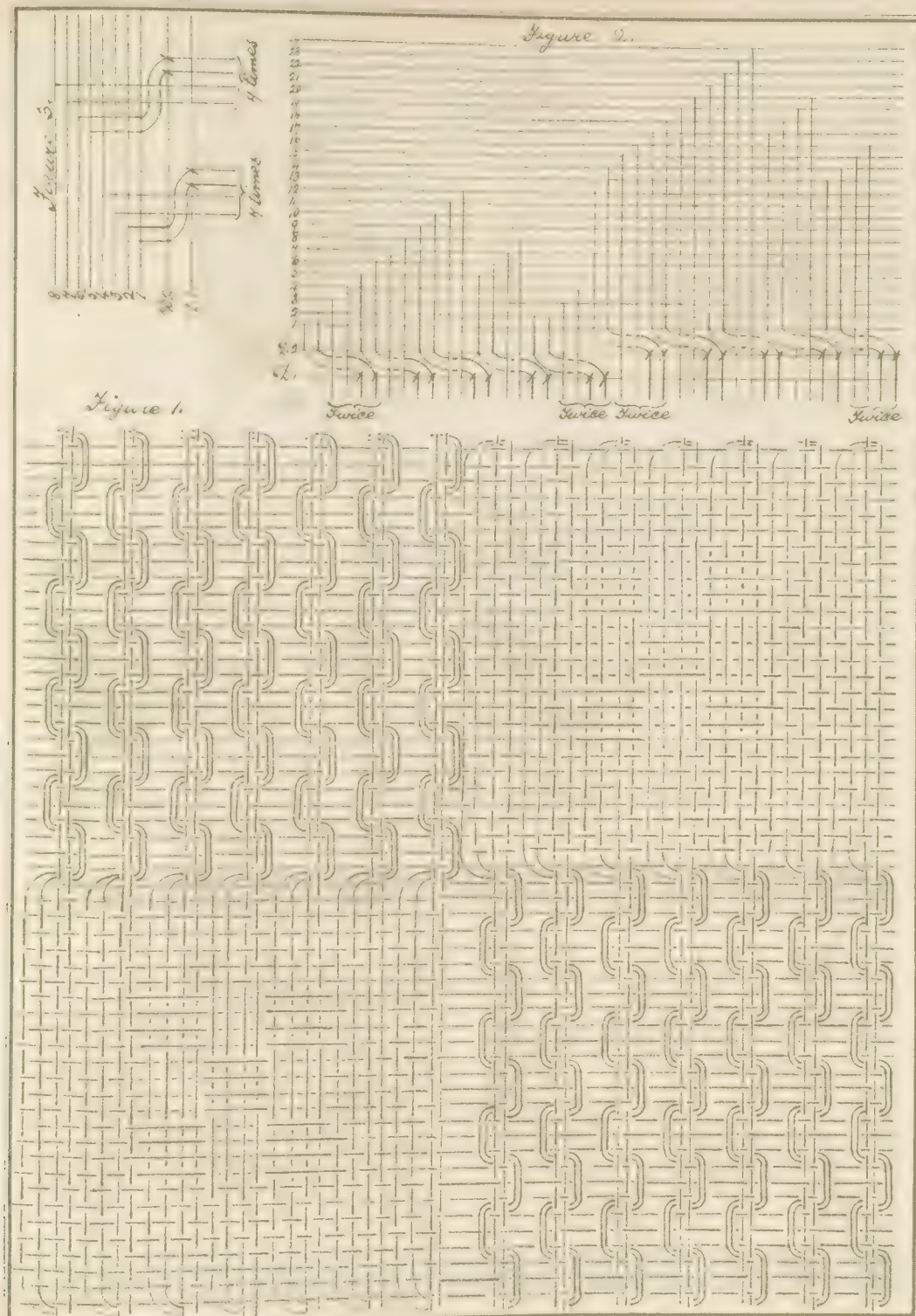
12TH DECEMBER, 1888.

DESIGNED BY R. LORD.



TAPESTRY.





WEAVING GAUZE CLOTHS.

THE JOURNAL OF FABRICS AND TEXTILE INDUSTRIES.

12-11 F. E. & M. 1890.

DESIGNED BY C. W. SANDIFORTH.

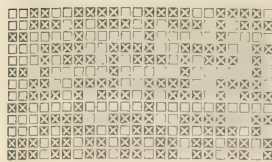


LINEN DAMASK TABLE COVER.

## FASHIONABLE \* DESIGNS.

## Mantle Cloth.

No. 557.



Design.



Draft.



Pegging Plan.

Warp :—

2 ends 2/10's, Black mohair.  
 1 end 9 skeins Twist woollen.  
 1 " 2/20's, Black mohair.  
 2 ends 9 skeins Twist woollen.  
 1 end 2/20's, Black mohair  
 mohair } 5  
 2 ends 9 skeins Black } times  
 woollen }  
 1 end 2/20's Black mohair.  
 1 " 9 skeins Black woollen.  
 23 ends in pattern.

West :—2 picks 2/10's Black mohair.  
 2 " 8 skeins Twist woollen.  
 1 pick 2/20's Black mohair.  
 1 " 8 skeins Twist woollen.  
 1 " 8 " Black  
 1 " 2/20's Black mohair.  
 2 picks 8 skeins Black woollen.  
 1 pick 2/20's Black mohair.  
 2 picks 8 skeins Black woollen.

13 picks in pattern.

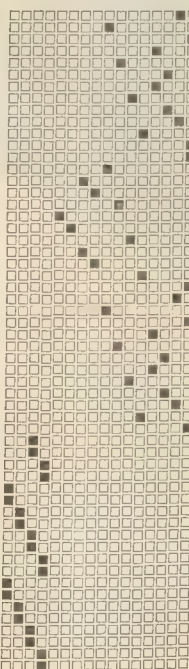
2,944 ends in warp; 46 ends per inch, woven in 11½ reed,  
 4 ends in a reed; 44 picks per inch; 64 inches in reed, to finish  
 56 inches; 7 healds; 26½ ozs. per yard.

## Worsted Trouserings.

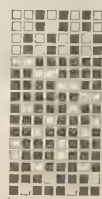
No. 558.



Design.



Draft.



Pegging Plan.

5,040 ends in warp. 78 ends per inch; woven  
 in a 12½ reed; 4 ends in a reed; 80 picks per inch;  
 64½ inches in loom; to finish 56 inches. Weight,  
 21 ounces per yard.

Warp :—20 ends 12's Black cotton.

1 end 14's Brown worsted } 4  
 1 " 18 skeins Brown woollen } times  
 1 " 14's Brown worsted }  
 1 " " " " }  
 1 " 18 skeins Brown woollen. } 3  
 2 ends 13's Twist, worsted } times  
 1 end 18 skeins Brown woollen } 4  
 2 ends 14's Brown worsted }  
 1 end 18 skeins Brown woollen } times.  
 1 " 14's Brown worsted.

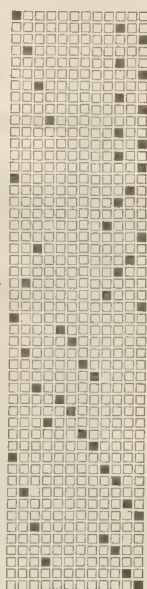
West :—1 pick 13's Black worsted.

1 " " Blue "

No. 559.



Design.



Draft.

Pegging Plan.  
Lift Black.

Warp :—2 ends 2/40's worsted, Black } 11  
 1 end 16 skeins woollen " } times.  
 2 ends 2/40's worsted, " }  
 1 end 2/32's worsted, Drab.  
 2 ends 120/2 silk.

West :—2 picks 2/40's worsted  
 1 pick 16 skeins woollen.

5,376 ends in warp; 84 ends per inch, silk being extra,  
 woven in a 14 reed, 6 ends in a reed; 56 picks worsted per  
 inch; 28 picks woollen per inch; 64 inches in reed, to finish  
 56 inches; 23 ozs. per yard.

## Fancy Suiting.

No. 560.

Warp :—2 ends Brown worsted, 2/10's.



Design.

2 " Black " "  
 2 " Brown " "  
 4 " Black " "

West :—1 pick Twist (Red and Black) 2/10's.

1 " Brown, "  
 6 picks Black, "  
 2 " Brown, "  
 2 " Black, "  
 2 " Brown, "  
 6 " Black, "  
 1 pick Brown, "  
 1 " Twist, "  
 2 picks Black, "

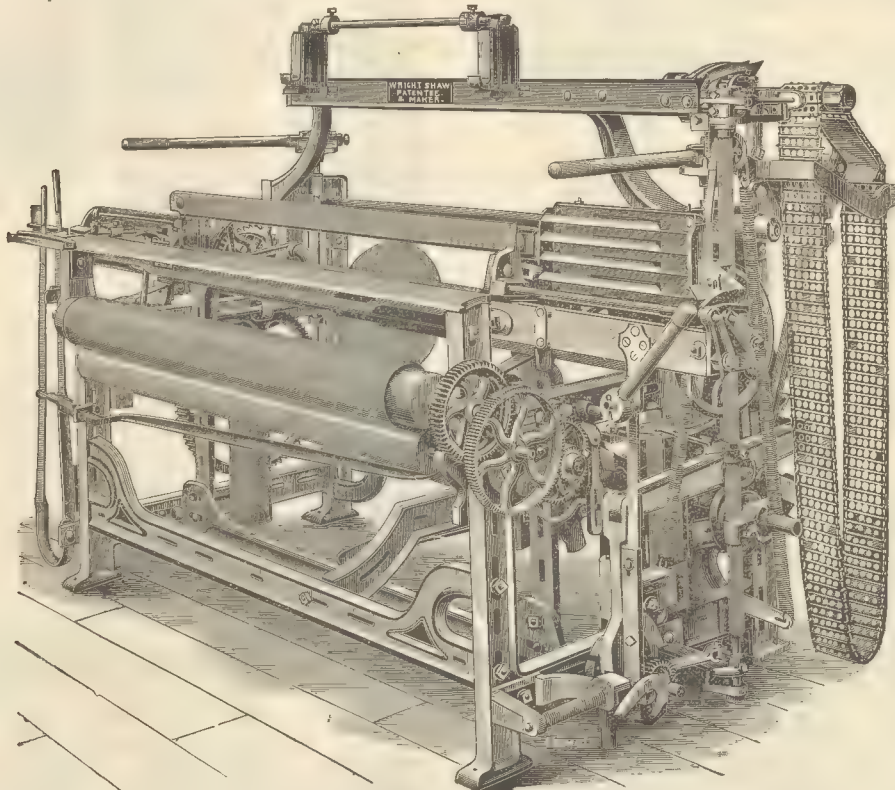
2,016 ends in warp; 31½ ends per inch; woven in a 7½  
 reed; 4 ends in a reed; 32 picks per inch; 64 inches in loom;  
 56 inches finished. Weight, 23 ounces per yard.

We understand that the firm of Samuel Brooks, Union Iron Works,  
 West Gorton, Manchester, and Junction Iron Works, Newton Heath,  
 have been awarded a gold medal at the Barcelona Exhibition, for their  
 preparing, spinning, twisting, and winding machinery.

## MACHINERY, &C.

### A Scarf, Handkerchief, and Check Loom.

Amongst the many inventors who have brought the looms of the present time to such a high state of perfection may deservedly be mentioned Mr. Wright Shaw, of Bank Foundry, Bredbury, near Stockport. The resources of his inventive faculties have been exercised upon looms for weaving scarfs, handkerchiefs, and checks, and probably no other loom for such purposes is capable of performing in such a manner as the one Mr. Shaw terms the "Champion." How far he is justified in the use of this term will be seen from the particulars we here give. The "Champion," shown in the engraving given below, is a drop box loom for five shuttles. The object of its inventor has been to simplify the drop box loom, and to bring such parts as have any liability to cause defective work within easy reach of the weaver,



Scarf, Handkerchief, and Check Loom.

also to stop the great wear and tear on the pattern chains by having them sprung up too tight, and at the same time to economise space as well as pattern chains. Thus we find the pattern cylinder and horizontal rods are placed at the top of the loom frame instead of at the bottom, as is usually the case, and two of the pegged cylinders generally used are dispensed with. There are two swivel brackets, the one attached to the outside of the sliding rods being fixed on the top of an upright shaft, the other being secured to the bottom of this shaft. Another feature of this loom is the pattern chain economiser, which will give 4, 6, 8, 12, or 24 picks from any pattern chain link. This appears to us to be one of the most simple devices possible to attach to a loom, and it is within sight and easy reach of the weaver, and is made so sensitive that, when the weft breaks, its movement is stopped, and the weaver has no difficulty in keeping her pattern right. This pattern chain is rendered capable of performing so much by mounting a disc upon a peg cylinder. On one face of this disc are a number of pegs which, by the oscillation of the cylinder bracket are brought within reach of the hook, which causes the disc to make a portion of a revolution. On the opposite face of the disc are a number of screw pins, which in the revolution of the disc are brought into contact with a stop, fixed to the frame. Whenever this occurs, a second disc, which has been called "a spider wheel," of similar construction to the first, does not come within reach of the action of its hooked catch, and hence the pattern cylinder is arrested in its revolution,

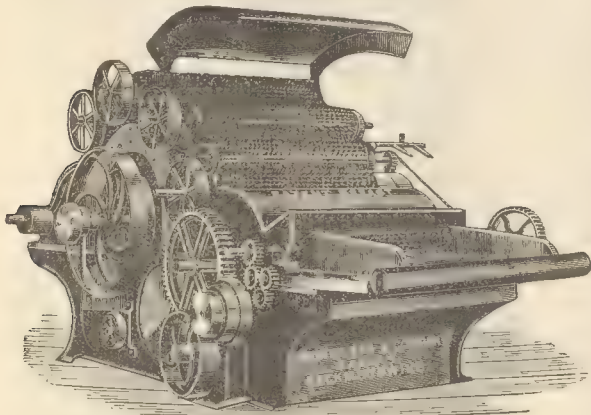
which permits the pattern on the card facing the horizontal sliding rods to be repeated a definite number of times, until the omission of one of the screw pins allows the bracket to beat up its full distance, and the catch to fall into gear with the "spider wheel," and, by giving an eighth of a revolution to the cylinder, brings a fresh card up, and makes the required change. The value of this arrangement is placed beyond doubt by the public trials which were made with the loom at the Manchester Exhibition with the greatest success, before thousands of people, and to which we refer below. Another important feature is that the weft fork is made to accomplish four different duties. Firstly, it stops the loom if the weft breaks; secondly, it stops the taking up motion; thirdly, it stops the pattern chain; and fourthly, it stops the chain economiser. The four operations are accomplished simultaneously and thus the pattern chain is kept right when the weft fails. Mr. Shaw considered that a great improvement could be accomplished in the rising and falling of the boxes, and the result of this has been the introduction of two long steel springs coupled by a strap working over a pulley. By this means, the boxes are much better

balanced. By lifting a small lever, usually called the rack handle, with the toe, you draw the rack that lifts the box out of gear, thus the weaver has both hands free to raise or lower the boxes as required. We are informed by the maker that this loom can be worked at one-sixth the usual cost in pattern chains. The high speed at which the loom can be run, as well as other advantages resulting from the adoption of this loom can be gathered from the following particulars of what was accomplished during the Manchester Exhibition by Mr. Shaw, who wove a cloth containing six different patterns produced by eight links of the pattern chain. The first pattern consisted of five colours, two picks of each colour being used. The second pattern had four picks of each colour, the third had six, the fourth had eight, the fifth had twelve, and the sixth had twenty-four. The alterations necessary to change each pattern did not occupy more than two minutes each. Another pattern, 33 inches square, was being woven, when a change was made to weave one 168 inches long, with the pattern chain mentioned above. This change was made instantly and without stopping the loom. By the introduction of five set screws into the chain economiser—still with the same pattern chain—a scarf 54 yards long, and bordered at each end, was woven. The change required to be made to weave this pattern did not occupy more than 2 minutes. Every stripe in the whole length of a pattern can be varied quite easily. In fact, the loom will weave a scarf 10 yards long, with variations in the stripes from beginning to end,

without any mechanical alterations. The patterns here mentioned consisted of a 32's warp with 96 picks per inch, and were woven at 180 picks per minute. The following is a correct copy of the checking and colours implied when weaving six different patterns by eight links of the pattern chain tied round the octagon barrel. The smallest pattern being all two picks of each colour as follow:—Two white, two red, two opal, two blue, two gold, two opal, two red, two blue. It is difficult to understand any loom maker daring to put his loom to such a severe test, as is the above pattern when running at 180 picks per minute, in an Exhibition before large numbers of people of all classes, where, had a shuttle fallen out, the result might have been serious. Mr. Shaw asserts that his loom never threw out one of its shuttles during the whole time of the Exhibition, and the loom was run all the time without a shuttle guard, weaving a pattern of the above description, at 180 picks per minute, requiring the boxes to be changed 90 times per minute. Simplicity of its construction is the parent of its actions. We consider the loom fully merits the name "Champion," which Mr. Shaw has applied to it, and we can recommend those of our readers who have not seen it to communicate with him, when an opportunity may be had of judging of its practical value.

### Morton's Improved Breast for Teazels.

In the preparing of wool and other similar fibres for scribbling and carding machines, the material is first put through a machine called a Teazel or Tenter Hook Willey. This teazel is fitted up with a spiked swift and spiked workers. The material is placed on a feed table, from which it is taken by the swift and then broken up, opened out, mixed and, to some extent, cleaned. For the better carrying out of, and more effectually answering, these purposes, Messrs. Morton, Son and Co., Machine Makers, Heckmondwike, have recently made an improvement in the machine. This improvement consists of a spiked breast, fixed between the feed table



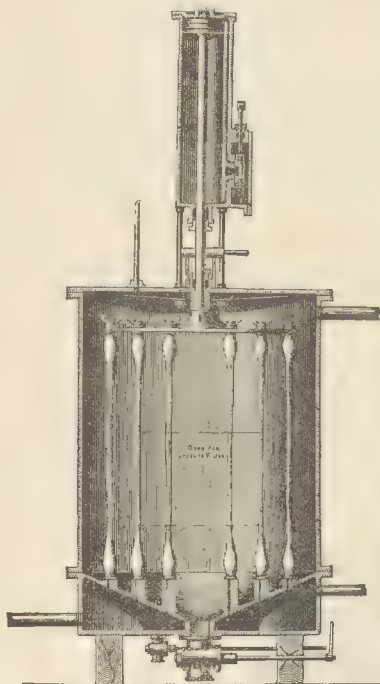
Morton's Improved Breast for Teazels.

and the swift. This breast takes the material off the feed table and carries it over coarse grates which are secured under the breast, and thus allows the dirt, moils, bits of straw, and other useless substances, to drop out before they are mixed up in the material. In the ordinary teazel, the swift takes the material direct off the feed table, when it is at once mixed up by the workers, thus mingling in the dirt, &c., with the material. This is prevented by the improvement now alluded to, as the dirt, &c., are allowed to drop under the breast before they reach the swift or workers. The improvement also causes the material to be very much better willeyed, opened out, and mixed, as the breast carries it to the swift in a much lighter quantity, or "flake," and thus allows it to be better mixed by the workers. It also effects a great saving in the wear and tear of the cards on the scribbler and carder, as it opens out the "cotts," or knots of wool, which would otherwise go into the scribbler or carder. Also, the cards require much less cleaning, by reason of the material being so much cleaner, and free from dirt, &c. The output of the machine is not affected by adopting this improvement, which has been fixed on several teazels now in use, and is giving every satisfaction.

### Softening of Water.

In our last issue, we referred, at some length, to the subject of filtration of water, and special mention was made of the Pulsometer Company's patent "Torrent Filter." That softening of water is closely allied to, and, in many cases, inseparable from, filtration of water cannot be denied, and, therefore, we have pleasure in bringing to the notice of our readers the method employed by the Pulsometer Company for this purpose. It is, without doubt, as important to be in possession of a constant flow of soft, as of clear, water; for, although water may be perfectly clear, it may still contain properties which can only be eliminated by the process of softening. Our friends in the textile factories

know that they cannot get along with anything like that degree of satisfaction where hard water is all they have at hand, but, in such cases, all that is required is a simple and convenient apparatus, such as that made by the Pulsometer Company, and which we illustrate below. As a rule, there is no economy in using water in its natural state, it contains lime or other impurities too numerous to mention, in proof of which we may state that it is on record that, from a single locomotive boiler, as much as 1,300 pounds of incrustation have been taken out at one time. Whenever hard water is used for boilers, mischief results, and the period of the boiler's usefulness is shortened. The means employed for removing impurities—such as carbonate and sulphate of lime—from hard water are well known, as attention has been drawn to the subject not only by discussion but by advertising also. As a rule, the whole work of softening can be done, where the hardness is due to carbonate of lime, by the addition of lime water, and where the hardness results from sulphate of lime, by an alkali—such as caustic soda, or soda ash. By the use of these agents in certain quantities, the lime is thrown down as a precipitate, more or less flakey, settling sometimes rapidly, at other times in a less satisfactory way. The old plan of settling in large tanks is a good and efficient method of clearing water, but this is expensive, and the room required for it is too much. Probably, the most satisfactory method is that under notice, viz.:—the filtration of the water through



Pulsometer Co.'s Vice Versa Filter.

some woven material in the form of bags, as performed by the "Vice Versa" filter. Lime is often so fine that filtering it through the ordinary materials would be almost impossible, but the great feature in filtering through either linen or woollen cloth is that the lime is deposited over the surface of the cloth and becomes in itself a perfect filtering material. This mode of filtration, however, is not new, but, as hitherto carried out, it has possessed serious drawbacks—such, for instance, as the cleaning of the bags and rendering them fit for further use, for, when it is mentioned that the filtering was carried on from the inside of the bags, it is obvious that these must each be removed in order to be cleansed. The loss of time and the inconvenience and expense attending this method told greatly against its success. The means employed in the *Vice Versa* filter are, as the name implies, exactly opposite to this. That is, the filtration goes on from the outside to the inside of the bags, leaving the lime in a convenient position to be washed off. The bags do not require to be made of special cloths with expensive attachments, but are ordinary filter bags, such as have been used for filtration of sugar for a number of years. The bags flatten instead of being distended, but they filter just as well as by the old way. It is quite easy for the attendant to simultaneously clean all the bags without their removal and without hand power. The manner in which this is effected will be best explained

by reference to the engraving, which shows an iron drum with an internal conical bottom, and a piston worked by steam or water cylinder arranged above the filter. The filter bags are attached to suitable nozzles fixed to the piston and conical bottom. The lime water to be filtered is admitted to the drum surrounding the bags, and, passing through them to the inside, is delivered below the conical bottom in a filtered condition, leaving the lime and other impurities deposited on the outside of the bags. When it is desired to clean the bags, the piston is put in motion by the attendant, the outlet in the conical bottom is opened, and the lime, disturbed by the compression and extension of the bags, is carried away by the outrush of the water; in a few minutes the operation of cleaning is complete, the wash-out is then closed, and the apparatus is ready to recommence filtering. The bags are tied on with string to ordinary nozzles, and can be taken off or put on with the greatest ease. There is nothing in the apparatus to get out of order, and, therefore, any boy can attend to it. In the smaller sizes, for softening apparatus for boilers under 200 or 300 horse-power, the motion for cleaning is given by hand, but, whether by hand or steam, a few strokes only are required to effectually clean the bags. There are numerous advantages in the "*Vice Versa*" filter, which we commend to the notice of our readers. Any further information can be obtained from the Pulsometer Engineering Company, Nine Elms Iron Works, London, S.W.

### Automatic Sprinklers or Fire Extinguishers.

It is our intention to give particulars of the various "Automatic Sprinklers" or "Fire Extinguishers" that are now being put before the public by the makers of these appliances. Some time ago, we gave a description of the Grinnel, an extinguisher which, up to the present time, has held the field as being the most effective apparatus, of an automatic character, for the purpose of putting out fires, but our readers will, we are sure, agree with us in saying that, however efficient an appliance may be, the very ground work taken up by the makers gives new ideas for others to work upon, and advantage is taken of little deficiencies that may exist in the mechanism to produce a more efficient apparatus, and this goes on from year to year without ceasing.

#### THE "NEPTUNE" SAFE AUTOMATIC FIRE EXTINGUISHER.

The "Neptune" Safe Automatic Fire Extinguisher, now being patented in Great Britain, France and Germany, by Messrs. Edwin Walker and Co., Heckmondwike, promises to bring the automatic system of dealing with fires into far more general favour than it has yet received, for though this, the most effectual manner of fire extinction, has met with well-merited approval and adoption by a large number of firms having great risks, both in this, and other, countries, yet it is making its way but slowly amongst firms having less, or only ordinary, risks, owing mainly, we believe, to the fear that, in lessening the fire risk, they would be adding a water risk, which, though not at all destructive, is very damaging to nearly all classes of goods and machinery, and for which there would be no compensation. That this fear is not groundless is proved by the fact that the best sprinklers now in use are so very thin in some of their most vital parts, also so very tickle in construction, that they cannot reasonably

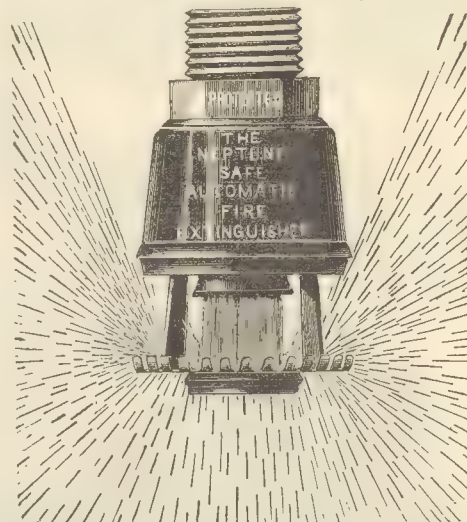
be said to be either durable or very safe, several accidents having already happened where serious water damage has been done by the sprinklers coming into operation through other causes than fire, not the least fire being near them; and, doubtless, another hindrance to the more rapid and general adoption of the system is the knowledge that sprinklers, as hitherto made, somehow gradually lose their sensitiveness in a few years, requiring very much more heat to bring them into operation than at first, thus, in time, becoming practically useless. Happily, for the automatic system, and, for that matter, for insurance companies and the public generally, the "Neptune" is a completely new departure from any of its predecessors in these respects—being both a valve and a sealed sprinkler combined, it is doubly secure against leakage, and without the least trace of tickleness in its construction, so that it is perfectly safe to fix it anywhere; also, and what is of the utmost importance to the success of this system, the manner in which this sprinkler is soldered renders it *permanently sensitive*, so that it will come into action quite as readily after being fixed fifty years, as on the first day it is fixed. This valuable improvement is obtained simply by there not being the least brass surface in close contact—even where the joint is made with the sensitive solder, the brass surfaces are held completely apart by the solder itself forming a bead, or circular dovetail, quite round and between the same, which, whilst holding the parts firmly together for any length of time, must also be easily acted upon and fused by the



Actual Size Closed.

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least fire during any period of its history. Another fact we must not fail to mention in this brief notice is the extremely simple, yet effectual, manner in which the inventor of the "Neptune" sprinkler has overcome what has always been considered one of the most difficult problems in the manufacture of these ingenious devices, viz.:—the making of the water joint so that it is tight under the most trying varying pressures to which it may possibly be subject, and so that it may be easily opened, with the slightest pressure, whenever the soldered joint is fused, and, at the same time, keep the water completely in check until the said soldered joint is entirely separated, for it is well known that, should the solder when fusing be overtaken by



Actual Size in Action.

the slightest flow of water coming into contact with it, it instantly arrests the fusion, and the thing becomes at once a failure. A great amount of skill and ingenuity have been brought to bear on this single point, but, in by far the greater number of instances, entirely in vain—in valve sprinklers, the double flexible diaphragm or the enlarged flexible chamber—and in sealed sprinklers, paraffine wax, or other chemical compound, being the only devices that have hitherto been in the least reliable, whereas the Neptune—without any enlargement of the orifice, or the least weakening of any of its parts, or the use of any mysterious or uncertain chemical compound—completely solves the problem at a single stroke, by the simple insertion of a hollow flexible plug into the end of the ferule, with its open end to the water, and its closed end resting on the cap or deflector, which is soldered to the end of the ferule, and, of course, the water pressing inside the plug holds it tight against the sides of the ferule, until such times as the cap or deflector is let loose by the melting of the sensitive solder, when it is swept out by the rushing water, for, being surrounded with tin-foil, it cannot possibly stick, no matter how long it may have been in position. Anything simpler or more effectual, we think, cannot be imagined—and men who have been striving for years with this hitherto difficult problem, must, on seeing how easily the Neptune solves it, be forcibly reminded of that renowned historical incident of Columbus and the egg. Indeed, we must say this sprinkler is, throughout, simplicity itself, as well as durable in every part, yet as sensitive as the most tickle valve sprinkler ever yet made. In our next issue we shall give a description and illustrations of the mechanism.

#### THE "MAYALL" AUTOMATIC SPRINKLER.

One of the latest inventions for fire extinguishing is now being made by Mr. William Mayall, of Mossley, near Manchester, (a name that is now pretty well known in connection with sprinklers) and who, after numbers of experiments and tests, has put upon the market an "Automatic Sprinkler" which has its merits, and which we propose to describe. The mechanism will be understood by reference to the illustrations. Fig. 1 is a sectional view of the apparatus closed, Fig. 2 showing it open. The extinguisher is connected to the supply pipe by the nozzle A, the water joint is made at B, the other extremity of the nozzle, which forms the valve seat, by a flat valve having a small cone in the centre, and which is supported in position by the lever C, soldered at D by a low fusing solder. A circular plate, having a finely-serrated edge, to distribute the water, called a deflector, is affixed to the spindle of the valve. Upon the outbreak of a fire, the heat,

rising to the ceiling, quickly melts the fusible joint, the lever drops, and the valve and deflector fall and rest upon the shoulders EE, when the water, having a clear thoroughfare, is distributed in a fine spray over a large area. It is generally known that the principal points of a perfect sprinkler are tightness, sensitiveness to heat, and non-liability to corrosion or decay. The chief feature of this sprinkler is the novel means by which a perfectly tight joint is preserved between the valve and its seat under all pressures, and consists of the annular chamber or expansion ring F, of thin copper, securely brazed in the length of the nozzle, and whose action is as follows:—The ring being formed of an elastic material, naturally expands under the pressure of water, whether the pressure be constant or fluctuating; this expansion has both an upward and a downward direction—the expansion of the upper surface of the ring, acting on the yoke G and lever C, tends to draw up the valve to its seat, while the expansion of the under surface of the ring directly forces the valve seat down on to the valve. The greater the pressure of water, the greater is the expansion, and the tighter are the valve and its seat pressed against each other, so that, the greater the pressure, the tighter is the joint, and absolute immunity from leakage is secured. So great is the relief afforded the solder joint by this double action of the expansion ring, that almost all strain is removed, and it is impossible to fracture it by any pressure that may be applied. That this is so will be seen when it is stated that the expansion ring—solidly brazed—may be burst at the extreme pressure of nearly 2,000 lbs. per square inch, while the solder joint—weak by itself—remains absolutely intact and perfect. As to the capabilities of the sprinkler, a series of tests were given recently, before a number of the representatives of various insurance offices, at Mossley, particulars of which have been supplied to us. The first test was a quick fire, which took place in a wooden shed about 17 feet square and 9 feet high; one sprinkler was attached to a pipe brought from the water main to the centre of the roof. An area of about 12 feet square was covered with shavings to a depth of 4 inches and sprinkled with paraffine, which made a considerable fire when lighted, the heat of which caused the sprinkler to operate in 10 seconds, and the fire was totally extinguished in less than one minute. Upon examination of the material

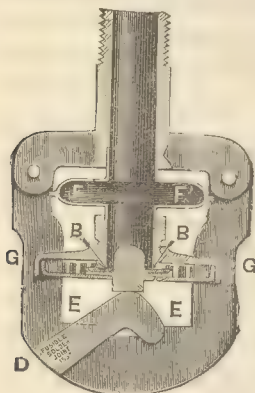


Fig. 1. Closed.

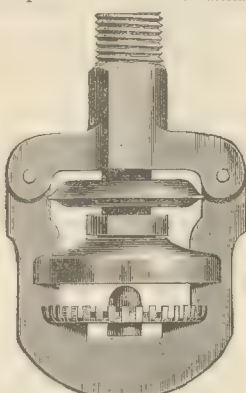


Fig. 2. Open.

it was found that only very little was consumed—in fact, the effect of the fire was only apparent on those places where it was kindled. The second test was a slow fire in the same shed; upon the soaked materials of the first fire a few dry shavings were spread, and upon these were placed old bobbins and broken skips. A light was applied at the point farthest away from under the sprinkler, and the material slowly burned for two minutes 56 seconds, when the sprinkler came into action and speedily extinguished the small portion that was on fire. It is only fair to say that, in this case, the circumstances were most disadvantageous to the sprinkler, as, in addition to the combustibles being placed on a surface saturated with water, and being kindled as far from the sprinkler as possible, a considerable quantity of heat escaped through holes and cracks in the roof, and the door was open till just before the sprinkler went off, and the fact of its operating so soon with such a small amount of heat was considered very satisfactory by those present. The third test was for distribution of water under various pressures. An actual pressure of rather less than 5 lbs. was obtained, and with this the water was distributed over an area 14 feet in diameter, so that the top room of a building supplied by a cistern would be effectually protected by the sprinklers placed 10 feet apart. With a gradually increasing pressure, the display was more dense and greater in area, till, with 100 lbs., it covered nearly 30 feet in diameter. The fourth test was a fluctuation pressure test. It is well known that this is the severest trial a sprinkler can be put to, as a constantly fluctuating pressure causes most sprinklers to leak. In this case, the visitors were shown a sprinkler attached to a pump working 88 strokes per minute, the pressure fluctuating every stroke from 1 lb. to 600 lbs, and the

sprinkler joint remained perfectly tight, thus demonstrating that leakage is absolutely impossible. The fifth, and last, test was to ascertain the bursting strength, and for this purpose a valve on the outlet of the force pump was gradually closed, thus bringing the whole force of the pump to bear on the sprinkler, which, after a few strokes, burst at 1,960 lbs., amid expressions of astonishment and admiration from those present. The accuracy of the above tests Mr. Mayall and others who were witnesses vouch for. We may add that, in connection with the sprinkler installations, there is an automatic fire alarm, which consists of an automatic valve connected to a gong and steam whistle, which are directly operated by the flow of water caused by one sprinkler coming into operation. It is thus apparent that an alarm will be given either in case of fire, or—which is almost equally important—in case of leakage, and will never cease until the flow of water is stopped. Mr. Mayall will give full particulars and estimates for installations on application.

### Robey and Co.'s Exhibits at the Smithfield Show.

One of the principal exhibits and greatest novelties at this Show is a horizontal steam engine of 10 H.P. nominal, fitted with patent trip expansion gear. This engine is of substantial construction, suitable for doing heavy work, and is, at the same time, provided with a high-class expansion gear for securing the greatest economy of fuel and perfect governing under varying loads. It is an engine which can be employed in the daytime for any class of work with the greatest economy, and at night can be employed for driving a dynamo for electrical illumination. It is fitted with a patent electric-regulator, and the action of this regulator upon the valve gear is shown. By means of this regulator, the engine adapts its speed to the number of lamps burning, and can also adapt itself to the work of charging accumulators. In addition, there is an 8 H.P. horizontal engine with link expansion gear and patent governor. This is of somewhat similar construction to the 10 H.P., still giving very excellent results, both as regards economy and regularity; it is not, however, so well adapted for being controlled by electricity. Another exhibit is a 6 H.P. vertical engine, fitted with automatic expansion gear of the same class, and a standard 8 H.P. portable engine.

### The Titancrete Company.

A Company has just been formed in Manchester, under the name of the Titancrete Company, Limited, to take over the business carried on at 8, Deansgate, Manchester, where the manufacture of the material, from which the Company derives its name, has been carried on for a considerable time. The nature of Titancrete may be described as concrete or cement of a carefully selected and adjusted mixture, compressed or moulded upon lattice work skeletons or frames of ironwork or steel, or, in the case of columns, upon coiled lattice work foundations, and presenting, where required, a highly polished surface resembling marble, red or grey granite, or malachite. It possesses, in a striking degree, the qualities of lightness, with exceptionally great strength, and effects very considerable economy, in the construction of buildings, by enabling a proportion of the usual supporting girders and uprights to be dispensed with. Titancrete is a patent material which, up to the present, has found much favour in the building of factories, &c., being a thoroughly fire-proof substance, and much lighter and cheaper than iron. It is also of great value in the construction of cisterns, tanks, &c., and may be employed by manufacturers generally for a variety of purposes, too numerous to mention. As an instance of the high value which the inventors place upon Titancrete, we may say that they offer to take the purchase money in shares which shall only rank for dividend after the ordinary shareholders have received 10 per cent. per annum. We commend the use of this substance to manufacturers generally.

### ODDS AND ENDS.

Hungarian wools were at one time classified under two distinct heads—mountain wool, which was very long and of ordinary quality, being supplied by the common Hungarian breeds, and the very fine staple obtained by the introduction of the merino breed. These two classes still exist, but the fluctuations of the woollen industry have given rise to new exigencies, and it has been necessary to satisfy the demand by cross breeding. One of the results produced is the wool termed "double clip," obtained by the crossing of the German and Hungarian breeds; it is never of very long staple, yet, as the name implies, there is the advantage of the two clips, one in the spring, and the other in the summer.

The following modification of the rules relating to pattern and sample post was issued by the Post Office authorities recently. Commencing with this month, patterns and samples, when returned to the trader or firm by whom they were originally sent, will be allowed to pass at the pattern rates of postage, viz.:—For a packet weighing not more than 4oz., 1d.; between 4oz. and 6oz., 1½d.; between 6oz. and 8oz., 2d. Such packets must be returned in the original wrapper—the written address being carefully erased, and the words "returned patterns," or "returned to," being prefixed to the printed address of the trader—or, in the original wrapper reversed, the reverse side bearing the printed address and trade of the trader or firm; or in a separate wrapper bearing the above printed address.

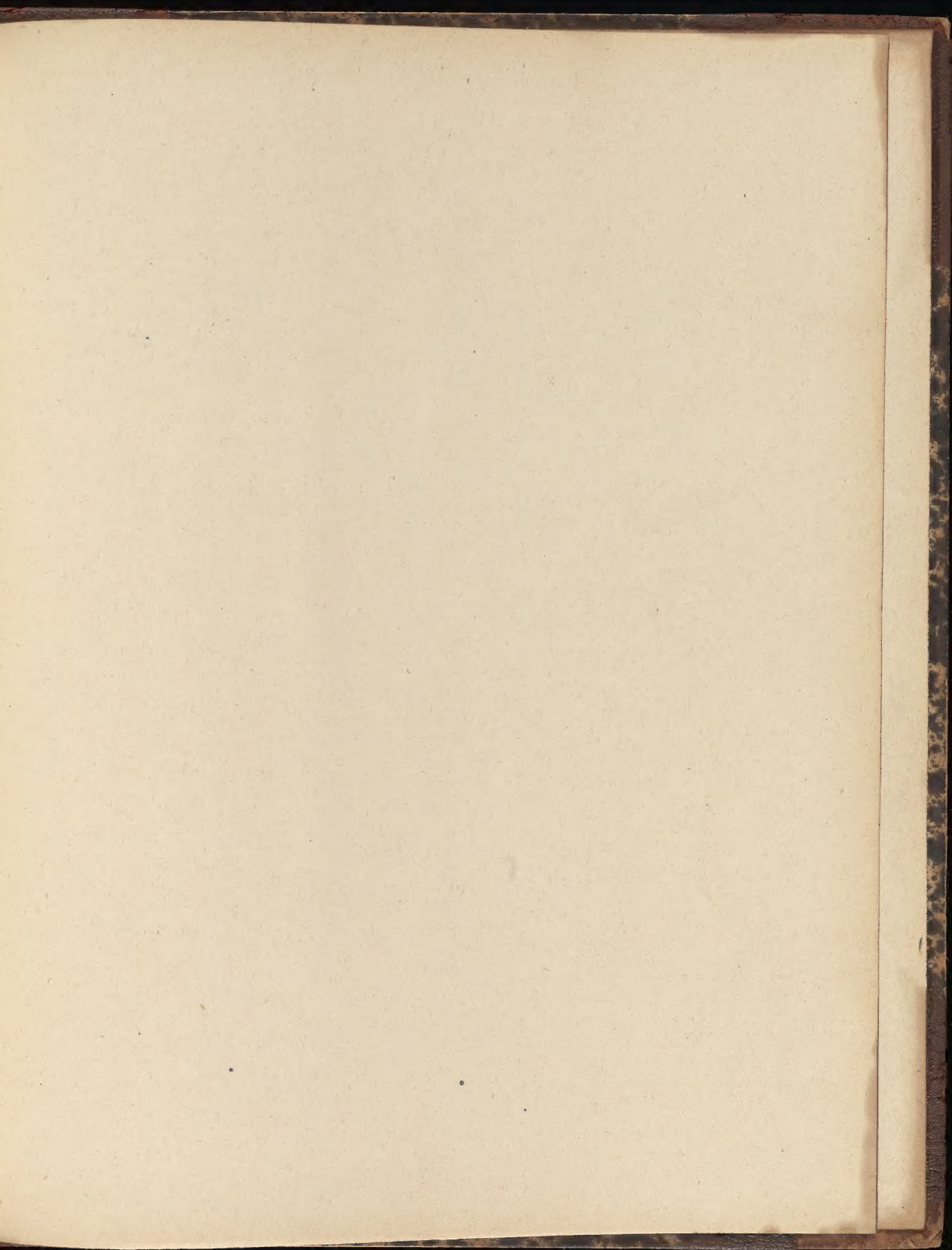
## PATENTS.

## Applications for Letters Patent.

Actuating dabbing brushes. G. Dixon, Leeds.	15th Nov. 16,598	Moistening air of factories. R. H. Neill, Belfast.	13th Nov. 16,425
Belting. A. Kennedy, Belfast.	1st Nov. 16,740	Pasted plush-like goods. M. Servin, London.	29th Oct. 16,533
Belts or bands (putting on) on pulleys. J. Harkness, London.	6th Nov. 16,963	Pattern chain apparatus for drop box looms. J. Shaw, Manchester.	2nd Nov. 16,828
Buffer for picking sticks. W. Harris, Bradford.	13th Nov. 16,416	Pickers for looms. J. and J. T. Riley, London.	7th Nov. 16,112
Belts. A. Guillemet, Levallois-Perret.	10th Nov. 16,310	Placing cop-tubes on spindles. E. Jagger, London.	9th Nov. 16,233
Bobbin-frames for looms. G. M. and A. Whittall, London.	20th Nov. 16,869	Printing handkerchief borders. W. J. Killow, Belfast.	10th Nov. 16,304
Clipping wool or hair of animals. T. Rose, Liverpool.	26th Oct. 16,412	Preserving pickers of looms. J. Hoyle, Accrington.	14th Nov. 16,503
Cap spinning and twisting. T. S. Tetley and T. Pickles, London.	6th Nov. 16,954	Printing on folded piece goods. W. Haigh, Manchester.	16th Nov. 16,634
Colour printing by rotary machines. J. M. Black, London.	6th Nov. 16,960	Pickers. H. Hind, Bradford.	17th Nov. 16,707
Consuming smoke and economising fuel. R. H. Mitchell, London.	6th Nov. 16,995	Picker drivers. O. Kennedy, Belfast.	17th Nov. 16,731
Carding engines. J. Thompson and T. Barker, Manchester.	6th Nov. 16,009	Picking gear for looms. F. W. Durham, Manchester.	20th Nov. 16,828
Crabbing, wet-finishing, &c., machines. A. Kirk and T. W. Stead, Halifax.	9th Nov. 16,240	Picker preservers. E. T. and M. J. Whittaker, Halifax.	20th Nov. 16,834
Combing cotton, &c. C. Lever, Manchester.	9th Nov. 16,241	Picking motion for looms. J. Stanhope, Guiseley.	21st Nov. 16,923
Carding engine flats and grinding. J. Seel, Manchester.	10th Nov. 16,297	Regulating the speed of bobbins in slubbing, roving, and intermediate frames. L. Sunderland, Manchester.	6th Nov. 16,018
Carding engines. F. Wilkinson, Manchester.	12th Nov. 16,342	Reeling yarns, &c. W. T. Stubbs and J. Heaton, Manchester.	14th Nov. 16,556
Carding engines in which flats are used. T. S. Whitworth and W. Lord, Manchester.	14th Nov. 16,498	Regulating delivery of yarn in looms. F. Wilson and A. Towler, London.	15th Nov. 16,572
Cords, fustians. R. Shackleton and W. Pickles, Halifax.	20th Nov. 16,835	Regulating feed of warp to loom heddles. Hamer, Richmond, Slater and Co., Bristol.	15th Nov. 16,576
Cleansing, scouring, &c., textile and other fabrics and fibres. J. Clegg, Liverpool.	20th Nov. 16,864	Removing burrs and thistles from fibres. W. E. Heys, Manchester.	17th Nov. 16,718
Driving belts. J. Johnstone, Glasgow.	29th Oct. 16,566	Self-acting mules. Guest and Brooks, and J. Cooker, Manchester.	26th Oct. 16,402
Dobbies of looms. J. and J. Ward, Halifax.	31st Oct. 16,672	Sewing thread and cord, and apparatus therefor. H. Bormann, London.	30th Oct. 16,652
Drying fibrous and like material and bleaching, &c. R. Howarth, London.	1st Nov. 16,731	Smyrna-velvet, Smyrna-Brussels, and Smyrna-tapestry carpet. A. Leven, Cologne.	31st Oct. 16,669
Dyeing or bleaching roving yarns or threads in cop or bobbins. G. Young, London.	1st Nov. 16,757	Selvages (fast) on double pile fabrics, and apparatus therefor. Messrs. Priestley, Bradford.	6th Nov. 16,007
Dyeing or bleaching warps. J. H. and T. Pickles, Manchester.	2nd Nov. 16,804	Shuttle drivers for smallware looms. J. F. Ashton, Manchester.	6th Nov. 16,010
Dyeing woollen cloths, &c. (method of, and apparatus for). J. W. Hepworth, London.	6th Nov. 16,955	Shuttles for looms. L. Heap and E. Stansfield, Rochdale.	6th Nov. 16,012
Dobbies of looms. A. Sowden, Halifax.	7th Nov. 16,101	Self-acting stopping motions for bleaching, dyeing, &c. W. Bradbury and J. Beason, London.	6th Nov. 16,038
Double pile fabrics. O. and E. Dray and J. Simpson, Manchester.	9th Nov. 16,237	Shuttle-guards for looms. G. Shepherd and G. H. Pilling, London.	6th Nov. 16,058
Drawing rolls for fibres. W. P. Thompson, Liverpool.	13th Nov. 16,450	Spinning, twisting, and doubling yarns. H. Priestman, Halifax.	7th Nov. 16,115
Double woven frisé fabrics. H. Mullers and A. Spendler, Manchester.	14th Nov. 16,512	Steam boilers. J. Brooke, Halifax.	15th Nov. 16,578
Dyeing hanks of yarn, &c. J. and H. Husson, London.	17th Nov. 16,755	Smoke consumer and fire-bars. C. Womack, Barnsley.	15th Nov. 16,586
Dyeing or scouring yarns. O. L. Claudes, London.	17th Nov. 16,756	Stop-motion for twining jennies and mules. W. and L. Tolson and J. Adams, Huddersfield.	16th Nov. 16,661
Embroidery or perishable or removable tissue. R. Haddan, London.	30th Oct. 16,647	Self-acting mules. J. Albinson, London.	20th Nov. 16,842
Economisation of fuel and consumption of smoke. J. and G. C. Hilton and E. Jackson, London.	6th Nov. 16,968	Strengthening and securing the ends of cotton bands. T. Blackburn, London.	20th Nov. 16,843
Easing tender warps and regulating woollen and worsted looms. T. H. Brigg, Otley.	22nd Nov. 16,976	Spinning machine rollers. J. Maddocks and W. C. Whitehead, London.	20th Nov. 16,875
Fuel economiser and smoke consumer. J. and G. C. Hilton and E. Jackson, London.	27th Oct. 16,495	Securing pulleys to shuttles of looms. J. Wilson, Halifax.	21st Nov. 16,921
Grinding the revolving flats in carding engines. J. E. Platt and J. Fiddler, Manchester.	29th Oct. 16,551	Testing the strength and elasticity of yarn or thread. J. A. Pierrel and C. U. Piat, London.	30th Oct. 16,638
Grinding carding engine flats. J. A. Dyson and B. Blackburn, London.	3rd Nov. 16,908	Toilet quilts. J. Lindley, London.	9th Nov. 16,281
Gassing frames. T. Rivett, Manchester.	16th Nov. 16,333	Twist-lace fabrics. W. Stevenson, London.	15th Nov. 16,606
Hand cards or cleaners. W. Alderson, Bradford.	18th Nov. 16,431	Temples of power looms. J. Murphy, Belfast.	22nd Nov. 16,984
Heckle for fibres. J. L. Henly and R. Shearer, London.	14th Nov. 16,494	Ungumming and bleaching by electrolysis, flax, &c. E. M. H. Audreoli, Brixton.	13th Nov. 16,484
Holding ends of yarns, &c., in looms. T. W. Smith and G. Thomas, Birmingham.	17th Nov. 16,705	Wire cloth and other looms. A. Knox, Glasgow.	29th Oct. 16,636
Jacquard machines. W. Barras and J. Harrison, Halifax.	1st Nov. 16,774	Winding yarn or thread. J. Corrigan, Manchester.	3rd Nov. 16,896
Knitted pile fabrics. J. Booth, Halifax.	21st Nov. 16,922	Wire cloth and other looms. A. Knox, Glasgow.	29th Oct. 16,636
Link-motion for rising boxes in looms. J. L. Byrom, Manchester.	31st Oct. 16,663	Winding yarn or thread. J. Corrigan, Manchester.	3rd Nov. 16,896
Loom shuttles, pegs, and bobbins. H. Durran, Huddersfield.	12th Nov. 16,361	Wool-combing machines. J. and C. Crabtree, London.	6th Nov. 16,039
Lace and other reticulated fabrics. F. H. Bowman, Manchester.	18th Nov. 16,420	Warp balling machines. J. H. Stott, Manchester.	8th Nov. 16,175
Marking woven piece goods with trade marks, &c., and printing and colouring such marks. J. Duxbury, Manchester.	31st Oct. 16,674	Winding yarns or threads. W. G. Gaas, Manchester.	10th Nov. 16,805
Mountings of rollers of roving, spinning, and twisting frames. E. Tweedale, Halifax.	2nd Nov. 16,823	Wool-washing. W. Cook, London.	14th Nov. 16,566

## Patents Sealed.

11,635	12,283	12,768	12,847	12,989	14,129	14,265	14,352
14,464	15,154	16,182	16,836	3,195	9,525	9,920	10,242
11,511	13,111	13,645	14,327	14,341	14,373	14,479	14,564
14,614	14,724	14,778	14,843	14,874	15,022	8,247	9,284
10,593	10,614	10,739	11,044	3,153	12,677	14,089	14,502
14,615	14,790	14,801	14,967	15,122	15,382	15,937	1,673
1,767	11,156	14,850	15,300	15,335	15,339	15,343	15,374
15,416	16,480	15,487	5,406	8,827	8,989	10,155	11,276
11,404	11,420	11,501					



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